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A.M.A. CONVENTION • KANSAS CITY, MO. • MAY 11-15, 1936

Surgery of the Cleveland Clinic

THE August number of the "Surgical Clinics of North America" is from the Cleveland Clinic, and is typical of the clinical work which these bimonthly books are bringing to subscribers.

For instance, there is an unusually practical clinic by Dr. Higgins on the Vitamin-A Diet Treatment for Dissolving Urinary Calculi; another by Dr. Lower on the Surgical Removal of Stones from the Ureter. There are five clinics dealing with diseases and disturbances of the gastro-intestinal tract; a clinic on surgical indications in sinus disease due to allergy. There are two clinics on the thyroid gland; others on irradiation in malignant tumors; on sacro-iliac joint disease; on the surgical problems in gallbladder disease; on postoperative emergencies in gastro-intestinal surgery; on lesions of the brain and cord; and on prostatic hypertrophy.

Altogether there are 20 clinics in this August number alone, every one important, four of them by Dr. George Crile himself. There are 94 illustrations—line plates, photographs, and x-ray pictures.

If you will turn to Page 3 you will see there the Complete Contents of this fine August number. You will there note how wide is the range of subjects covered; how important are these subjects in everyday general practice; how thoroughly experienced are the surgeons who here detail their findings, their diagnostic methods, their technic, their management of the cases they describe.

See Contents in SAUNDERS ADVERTISEMENT—Page 3

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OBSERVATIONS ON THE TREATMENT OF ACNE VULGARIS

CHAIRMAN'S ADDRESS

JEFFREY C. MICHAEL, M.D.
HOUSTON, TEXAS

Most of us are probably agreed that the therapeutic problem of acne is not yet satisfactorily solved. The early favorable results with roentgen therapy and especially the wider use of this modality following the more exact dosage obtainable with the Coolidge tube made it seem for some years that little more was needed, but a later appraisal of the results seems to have shown that there is still room for improvement. This realization together with the more recent knowledge of female hormone physiology and therapy has led to a renewed interest in the therapeutic problem of the disease. At present there is a state of flux concerning it. Formerly the treatment was practically routinized, the routine being so many doses of the roentgen ray. Now there is a greater tendency to recognize the limitations of the therapeutic weapons and to individualize and select treatment according to each case. To me this seems to be a step forward and one that should be encouraged. For that reason the present topic especially appealed to me, for it is only with a knowledge of what the present situation is that the weak points can be eliminated. With these thoughts in mind I feel that an analysis of the present therapy of the disease, the recent studies made in this field and those touching on it, together with some personal opinions about some of the more important phases of the subject will be of interest.

ETIOLOGY

A proper approach to the treatment of patients with acne demands a consideration of the etiology of the condition. This is necessary because the disorder is a syndrome rather than a disease *sui generis*. There are a few investigators who apparently regard acne vulgaris as essentially a local infectious disease of the skin based on a primary seborrhea (Sabouraud [1]), but most dermatologists apparently agree with Kyrle,[2] Mumford [3] and others that acne vulgaris is a syndrome in which the influence of one factor, or more likely a number of contributing factors, is of fundamental importance. The proponents of a primary local bacterial causation, despite a great deal of investigation, have still failed to prove their case. Ketron's [4] more recent investigations of Bacillus acnes as an etiologic agent led him to hesitate to ascribe any definite rôle to that organism in the etiology of the disease. Even in regard to the pustular element in acne, there is not at the present time absolute unanimity of opinion. Of course, most dermatologists attribute suppuration in the lesions to the staphylococcus, nevertheless there is not complete agreement about this feature of the disease, as is evidenced by the recently repeated assertion of Sabouraud [1] that the staphylococcus is not responsible for the pyogenic element in the lesions of acne. This naturally leads to the statement that the entire question should be reinvestigated, since it has a practical bearing on the therapy of the disease.

The second approach to an elucidation of the pathogenesis of the disease, namely, to regard it as a syndrome, is more in favor. Thus far it has led to nothing tangible; at the most to rather vague generalizations. Needless to say, clinical observation tends to indicate that certain internal factors, such as the physiologic and pathologic activities of the endocrine system and various minor disorders such as anemia, constipation and foci of infection, play a more or less important rôle in the production of the disease. Whitfield [5] recently discussed these factors and especially emphasized the importance of gastro-intestinal disturbances.

While recognizing the tremendous influence of sexual ripening on the incidence of acne, the dermatologist is still at a loss to explain why acne affects certain adolescents and spares others. Even more elusive apparently is the causation of the acne of adult life in which the hormone factor is not so much in the foreground. In short, while clinical observation has taught a great deal about the disease and its behavior, an elucidation of the pathogenesis of the disorder is still lacking. A better insight into the etiology of the disease is, of course, highly desired since the condition is of enormous practical importance.

The primary lesion of acne is the comedo. This is the first appreciable clinical manifestation of the disease. Why does a comedo form? The generally held conception of its formation is that of a mechanical blocking of the follicle by a hyperplasia of the epidermis at its mouth leading to a retention of sebum with an intermixture of horny cells from the follicular wall. Whatever the cause of the follicular hyperkeratosis, there can be hardly any doubt as to the primary rôle of this hyperplasia since histopathologic examinations (Unna,[6] Kyrle [2]) confirm it.

Read before the Section on Dermatology and Syphilology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.

1. Sabouraud, R. J.: Etiologie et pathogénie de l'acné; sa thérapeutique, Arch. dermato-syph., Hôp. St. Louis **2**: 537, 1930.
2. Kyrle, Josef: Vorlesungen über Histo-Biologie der menschlichen Haut und ihrer Erkrankungen, Berlin, Julius Springer, 1925, vol. 1, p. 198.
3. Mumford, P. B.: Acne Vulgaris, a Symptom, Not a Disease, Brit. M. J. **1**: 141 (Jan. 28) 1933.
4. Ketron, L. W.: The Relation of the Acne Bacillus to Acne Vulgaris: Experimental Observations, South. M. J. **21**: 368 (May) 1928; The Acne Bacillus: Variations in the Cultural and Morphologic Characteristics, Arch. Dermat. & Syph. **15**: 568 (May) 1927.
5. Whitfield, A.: Some Notes on Acne Vulgaris, Brit. J. Dermat. **46**: 257 (June) 1934.
6. Unna, P. G.: The Histopathology of Diseases of the Skin, translated by Norman Walker, New York, Macmillan Company, 1896, p. 352.

This hyperplasia occurs as a physiologic process during puberty, being part of the activation of the pilosebaceous apparatus by the gonadal stimuli of that period. It may also appear as a pathologic response to exogenous irritation (oil, wax, tar or paraffin) producing the disorder known as oil acne. Accompanying this hyperkeratosis of the follicular ostium there may be and usually is an increased sebaceous secretion, especially in cases of acne vulgaris, but this does not always occur and it is not necessary in the production of comedones. As is well known, a patient with acne vulgaris is occasionally seen whose skin is dry rather than seborrheic. At any rate, once the comedo is formed, there is only required the element of follicular inflammation to produce the clinical picture of acne. The difficulty, of course, arises as to the explanation of the development of comedones (and acne) in one adolescent and not in another since all are presumably under the same gonadal influence and show fairly uniform responses of the pilosebaceous apparatus in other directions (pubic, axillary and male beard hairs). Kyrle [2] expressed the belief that two possible explanations were conceivable, namely, an abnormal response of the pilosebaceous system in some subjects to the same stimuli, or in some cases an abnormal supply of hormone or other stimulus. Sulzberger, Rostenberg Jr. and Sher [7] followed the same line of reasoning. In a preliminary way they endeavored to ascertain whether there is a follicular hypersusceptibility to one or more of the possible irritants. Their preliminary investigations showed negative results but of course do not invalidate or weaken the hypothesis. Stein [8] advanced the hypothesis that acne vulgaris is caused by an irritation of the follicular wall by the elimination of metabolic products of the gonads and of substances absorbed from the intestinal tract. He quoted Blaschko as seeing the analogy in this process between true acne and acne artificialis caused by bromides.

In regard to the fundamental change, namely, the hyperkeratosis and epidermal hyperplasia that underly the formation of comedones, an interesting and perhaps significant chemical interplay comes to mind. In the experimental production of cancer use is made of tar or tar fractions (carcinogenic compounds) which when rubbed on the skin of a laboratory animal regularly produce cancer in a certain length of time. These substances operate by producing epidermal hyperplasia. Similarly, the acnes caused by greases, tar and oil that reach the skin from without (occupational oil acnes) are apparently produced by the primary irritation of the follicular ostium and wall. The carcinogenic compounds are known to have a phenanthrene nucleus and this substance is also present in coal tar and many greases. It is striking that the phenanthrene nucleus is found in both the male and the female sex hormones, which are closely related chemically (Dodds [9]). It seems more than a coincidence that the phenanthrene nucleus should be so closely connected with pilosebaceous hyperplasia and irritation. This thought may serve a useful purpose in further investigations on the pathogenesis of acne vulgaris.

The approach to the elucidation of the causation of acne by clinical studies has produced some interesting observations, but unfortunately nothing that can be said to represent a fundamental advance.

Among these newer contributions the investigation of the late Bruno Bloch [10] revealed the great frequency of acne. Bloch and his collaborators examined 4,191 school children between the ages of 6 and 19 (about equally divided as to sex) for the presence of acne vulgaris. Various degrees of the disorder, from a few comedones to true acne with papules and pustules, were tabulated. Their investigation showed that approximately 64 per cent of the children were affected with at least a few comedones. Of true cases (severe enough to be considered a disease) there were 8 per cent among females and 20 per cent among males. The preponderance of males in all the degrees of the disorder was definite and may have some pathogenic significance (Sulzberger, Rostenberg Jr. and Sher).

Without going into further details in regard to Bloch's observations it may be said that the well known observation of the chronological relation of acne and puberty was substantiated. So frequent was some manifestation of acne found among these adolescents that Bloch concluded that the disorder must be based on a physiologic condition, and that it is unncessary to invoke a pathologic substratum for the disease. In short, Bloch concluded that those elements that are almost taken for granted as important contributory factors in cases of acne, namely, constipation, anemia and menstrual disorders, are certainly not responsible for the disease among juveniles (his researches did not include acne of adult life). Apparently alone among earlier writers, Pollitzer [11] stated this same belief on the basis of his clinical observations.

In this country the study of Cunningham and Lunsford [12] deserves particular comment since it comprised an older group of subjects (women college students) than Bloch's. These investigators compared 2,974 young women with acne with 3,185 control students with regard to the incidence of constipation, colds and other infections, and the condition of the thyroid gland, nose and tonsils, as well as the menstrual history. There was practically no difference between the two groups in respect to the incidence of these systemic disorders to which a contributory influence on acne is so uniformly ascribed. The conclusion to be drawn from this study is that these disorders apparently have little or no influence on the incidence of the disease. But for the present, judgment on this conclusion must be reserved since the question of an inherited predisposition obtrudes itself and cannot be definitely evaluated, though it is probably of some moment (Siemens,[13] Stokes and King [14]).

As has happened so often before, biochemical studies have given no further insight into the pathogenesis of the disease. Greenbaum's [15] investigations of tolerance to dextrose led to nothing significant, and Strickler and Adams' [16] somewhat different approach to the question

7. Sulzberger, Marion; Rostenberg, Adolph, Jr., and Sher, J. J.: Acneform Eruptions, New York State J. Med. **34**: 899 (Nov. 1) 1934.
8. Stein, R. O., in Jadassohn, Josef: Handbuch der Haut- und Geschlechtskrankheiten, Berlin, Julius Springer, 1932, vol. 13, pt. 1, p. 70.
9. Dodds, E. C.: The Hormones and Their Chemical Relations, Lancet **226**: 931 (May 5); 987 (May 12); 1048 (May 19) 1934.
10. Bloch, Bruno: Metabolism, Endocrine Glands, and Skin Diseases with Special Reference to Acne Vulgaris and Xanthoma, Brit. J. Dermat. **43**: 61 (Feb.) 1931.
11. Pollitzer, Sigmund, in Darier, Jean: Textbook of Dermatology, ed. 2, Philadelphia, Lea & Febiger, 1920, p. 389.
12. Cunningham, R. L., and Lunsford, C. J.: Acne: A Statistical Study of Possibly Related Causes, California & West. Med. **35**: 22 (July) 1931.
13. Siemens, H. W.: Die Vererbungspathologie der Acne, München. med. Wchnschr. **73**: 1514 (Sept. 10) 1926; abstr., Zentralbl. f. Haut- u. Geschlechtskr. **22**: 362, 1927.
14. Stokes, J. H., and King, A. D.: Acne Vulgaris: Heredity in the Etiologic Background, Arch. Dermat. & Syph. **26**: 456 (Sept.) 1932.
15. Greenbaum, S. S.: Tolerance for Dextrose in Acne Vulgaris, Arch. Dermat. & Syph. **23**: 1064 (June) 1931.
16. Strickler, Albert, and Adams, P. D.: The Blood Sugar Metabolism in Certain Dermatoses, with Special Reference to Acne Vulgaris, Arch. Dermat. & Syph. **26**: 1 (July) 1932.

of sugar metabolism in cases of acne led them to deny any influence of sugar metabolism on the disease. The same authors [17] found no etiologic indications in the cholesterol metabolism of patients with acne. Knowles and Decker [18] and recently Immerman [19] sought to throw light on the etiology of the disease by means of gastric analysis but found nothing of significance.

Ramel's [20] investigation of the deep nodular form of acne vulgaris led him to the conclusion that this type is of tuberculous origin. This will hardly be accepted without further corroborative evidence, which, at most, was only partly given by von Kemeri's [21] report of the therapeutic benefit derived from the removal of foci of infection and subsequent tuberculin treatment. Of fifty-two patients twenty-two recovered after the removal of pyogenic foci, and all but three eventually were cured after subsequent tuberculin therapy.

INFLUENCE OF ENDOCRINE DISTURBANCES

Of especial interest at present are the recent studies of female hormone disturbances associated with acne vulgaris in which the newer methods of detecting the presence and amount of these substances in the urine has been employed.

Deseau and Guillaumin [22] used the interferometric method of Hirsch in a small series of patients selected because an endocrinopathy seemed to be a factor. The results confirmed this surmise as in each case an endocrine disturbance was indicated by the test. Measures taken to combat the disorders led to beneficial therapeutic results.

In this country Rosenthal and Kurzrok [23] appear to be the only investigators who have attempted a clarification of the problem of acne by hormone titration. They determined the presence of estrogenic substance in the urine of thirty-four patients with acne. Though estrogenic substance is normally found in the urine during the active sex life of all women, it was absent in twenty-seven of the patients, in normal quantity in six and in small quantity in one.

Along the same line is an interesting and optimistic report by von Leszczynski and Liebhart [24] on the therapeutic results obtained in cases of acne when based on hormone tests. These authors expressed the belief that acne may rest on a physiologic basis in early years (Bloch) but that acne in early adult life and later years is the result of a pathologic condition. Their patients were studied carefully for systemic disturbances, and tests for hormone function and presence were carried out as thoroughly as possible. For the determinations of estrogenic substance and the anterior pituitary-like principle from the urine of pregnancy, Zondek's methods were used. As a consequence of these studies they concluded that it is possible to divide patients with acne into three etiologic groups. This grouping is based partly on certain clinical characteristics of the disease and partly on the results of endocrine and general studies. So-called pure types of cases are not common. The three types of acne are as follows:

1. *Acne Sexualis.*—In pure cases it is limited to the face, especially the cheeks and chin. Seborrhea is slight or absent. Menstrual disturbances are usually present and exacerbation of the acne nearly always occurs during menstruation.

2. *Acne Intestinalis.*—This type has a predilection for the trunk. A seborrheic condition usually in moderate degree is nearly always present. Constipation of the atonic type, visceroptosis and colitis are frequent. These cases are based on intestinal stasis.

3. *Acne Thyreogenes et Seborrheica.*—This is a severe type in which large papulopustules as a rule affect all the usual regions. Kerosis is common. Enlargement and hyperactivity of the thyroid gland is frequently associated.

Identification of these types may require both clinical and detailed laboratory study. According to the authors recognition of these etiologic forms is absolutely requisite for the best therapeutic results. They did not use roentgen therapy but considered local applications to be important. The internalistic and endocrinologic outlook of these authors is stimulating. Their therapeutic results, contained in a report of fifteen patients, were apparently excellent.

Recently Van Studdiford [25] reported some interesting therapeutic results based on opotherapy.

For some time in selected patients I have made an attempt to utilize the newer knowledge of female hormonology in the therapy of acne vulgaris. In years past the crude extracts then available were occasionally employed but without any encouraging results. Since the availability of the newer endocrine products, I have worked in cooperation with gynecologists in an endeavor to employ these preparations in the most exact manner possible. The selection of suitable patients has been first made by me and the selection of hormone therapy by the gynecologist after a study of each patient from that special point of view. In this way twenty-six females have received what may be considered as reasonably good opotherapy. Up to the present the therapeutic results have been poor and discouraging so far as the influence of the hormone treatment on the acne is concerned. I have seen a number of instances of improvement or even complete relief of menstrual disturbances without corresponding benefit of the acne. It should be mentioned, however, that the studies of the individual case prior to the institution of glandular products in no way approached the thoroughness of von Leszczynski and Liebhart so that the type of therapy in some cases may have been ill chosen. My present opinion in regard to this phase of the therapy of acne is that theoretically it is enticing, but that practically, for the present, it is of slight value.

ULTRAVIOLET RAYS, VITAMINS AND BACTERIAL PRODUCTS

Butler [26] reported highly satisfactory results with ultraviolet rays. He did not give any figures but stated that relapses were frequent. Louste and Juster [27] likewise reported favorable effects with this method after

17. Strickler, Albert, and Adams, P. D.: The Cholesterol Metabolism in Certain Dermatoses with Special Reference to Acne Vulgaris, Arch. Dermat. & Syph. **26**: 11 (July) 1932.
18. Knowles, F. C., and Decker, H. B.: Gastric Acidity in Acne Vulgaris: Preliminary Report, Arch. Dermat. & Syph. **13**: 215 (Feb.) 1926.
19. Immerman, S. L.: Gastric Acidity in Acne Vulgaris with a Consideration of Normal Gastric Acidity: Report of Fractional Gastric Analysis in Ninety-Three Cases, Arch. Dermat. & Syph. **31**: 343 (March) 1935.
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a year's experience. Andrews [28] spoke favorably of it. A few physicians have used it conjointly with the roentgen ray, but this combination is not considered desirable by most dermatologists. Ultraviolet therapy has the great disadvantage of requiring a dose of some degree of erythema (sufficient to cause at least moderate desquamation) to produce favorable effects. For this reason I have used it in only a few instances in which the acne has been resistant to other measures and in these cases unsuccessfully.

On the whole, ultraviolet radiation plays a subordinate rôle in the therapy of patients with acne.

In a brief note Doktorsky and Platt [29] recorded definite clinical improvement in patients with pustular acne following the administration of vitamin D. My own experience with this preparation in eleven patients ranging in age from 14 to 22 years was not encouraging. My patients were all undergoing other forms of treatment at the same time but did not seem to respond any faster to this therapy than if vitamin D had not been administered.

Years ago, Fox [30] reported on the use of vaccine therapy and concluded that it was practically useless. This appears to be the generally accepted opinion at present, though an occasional patient with the pustular type of acne seems to respond to vaccine treatment. Staphylococcus toxoid, which was valuable in Dolman's [31] hands, was unfavorably reported on by Kindel and Costello [32] and Cornbleet and Rattner.[33] Bacteriophage, though found to be of value by Blum and Peyre [34] and Alderson,[35] was ineffective in Crutchfield and Stout's [36] experience.

ROENTGEN THERAPY

As is so well known, for many years the roentgen ray has been the dermatologist's chief weapon in the attack on acne. The action, technic and dangers of this physical agent are too well known to require description here.

In the earliest report in this country (Pusey) the results achieved were extolled and there followed a series of articles confirming this pioneer's enthusiasm. With the development of the technic of exact dosage (MacKee,[37] Witherbee and Remer [38]), the roentgen ray became the trained dermatologist's most commonly used method. So enthusiastic were the earlier reports that for years there was a general impression that little more than a proper knowledge of the use of the roentgen ray was required for the successful therapy of patients with acne. Earlier reports and impressions were that from 90 to 95 per cent of the patients were permanently curable in about four months. The treatment became almost stereotyped and aside from more or less casual directions about diet, routine correction of constipation and standard tonic regimen when obviously indicated, roentgen therapy was wholly depended on to produce satisfactory results.

Misgivings about this apparently successful therapeutic method led me [39] to investigate the end results obtained in a series of about 200 cases. This series, while too small to warrant the drawing of definite conclusions, showed trends which were obviously at variance with the commonly accepted belief of the efficacy of the roentgen ray. Since my report, those of Lord and Kemp [40] and of MacKee and Ball [41] have appeared and have confirmed what was indicated in my personal experience. In the main, these three reports agree. Lord and Kemp, however, did not, like myself, find that recurrences in the period of puberty and the immediately following years were so frequent. MacKee and Ball, however, confirmed my observations on that point. The figure for recurrences in patients up to 18 years of age found by me was 47 per cent after the first course of treatment, and after the second course (maximal permissible roentgen therapy) was 22 per cent. Thus, approximately half of the patients had a relapse and in one fifth there was ultimate failure. Of the patients up to 25 years of age, 35 per cent had a relapse after the first series of treatments and 12 per cent after an additional series. MacKee and Ball did not report their recurrences by age groups but stated that relapses were frequent among the younger patients.

Despite this frequency of relapse, it should be stated that the roentgen ray is a dependable agent and is curative in a vast majority of the cases of acne, the final successes approximating 80 per cent. It can be depended on to clear up the lesions in practically all cases in a period of from three to five months. In principle, therefore, if the necessity arises to eradicate the lesions, the roentgen ray may be depended on to do so with a remarkable degree of certainty. Unfortunately, as previously noted, this certainty of temporary cure is not followed sufficiently often by permanent freedom to be entirely satisfactory.

COMMENT

From the foregoing observations it is obvious that the treatment of patients with acne cannot be stereotyped if the best results are to be obtained. The choice of the therapeutic attack is a matter of analysis of the individual case. For the purpose of this analysis the important questions to be taken into consideration are (1) the information obtained by a history and systemic examination (foci of infection, anemia, diet, gastrointestinal function), (2) the age of the patient, (3) the mildness or severity of the case and (4) the endocrine factor, if determinable.

As to the first group of contributory causes (anemia, constipation and so on), it goes without saying that they should be taken care of according to general medical principles. The dietary regimen deserves special mention since there is no unanimity regarding the importance of diet in the disease. Apparently some physicians neglect it completely. Urbach [42] stated that there was no scientific evidence which indicated the type of diet

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that should be effective in the disease. Stokes [43] thought it of great importance and of valuable therapeutic assistance when carried out in the detail comparable to that in cases of diabetes. The type of diet best suited to the patient with acne is generally agreed on and need not be detailed. Every textbook contains a practically similar list of interdicted and permissible substances. In a former study I could not find that diet played any apparent rôle in the results obtained, yet it is unquestionable that in individual cases diet seems to be provocative of outbreaks and in some instances the breaking of dietary instructions has been followed by relapses in seemingly cured patients. White [44] reported a series of cases in which specific sensitivity to foods produced outbreaks of acneform lesions. These cases should not be confused with those of true acne, since he expressly stated that comedones were not present.

The same line of thought applies to a focus of infection; its presence may render therapy unavailing in some instances, while in others it seems to have no influence on the course or response of the disease.

In regard to the mildness or severity of the case, the important point is whether or not scarring is being produced. In some of the mild cases (judged by number of lesions) each lesion produces a small pit that in the aggregate becomes of considerable concern to the patient. If, on the other hand, the disease is mild and not causing scarring of any moment, a campaign of local therapy and general measures can be followed with more equanimity by the patient and physician than if the lesions are numerous, unsightly and producing large permanent scars. Under the latter circumstances the therapy that promises to control the disease in the shortest possible time is indicated.

The age of the patient is one of the most important considerations in a choice of therapy. This personal opinion is based on the conviction (supported earlier in this paper by reference to recorded experience) that age is the most important element in the prognosis, especially when roentgen therapy is used. When that method of treatment is depended on for cure, about half the patients under 18 years of age have a relapse. Since the treatment consumes time and is somewhat expensive, the number of failures leads to considerable dissatisfaction. It has therefore been my practice for some time to withhold roentgen therapy from all patients under 18 years unless there has been absolute failure of response to other measures and marked scarring is being produced. In short, in juvenile cases of acne roentgen therapy is hardly ever used. It seems to me best to treat these patients persistently with local applications of a stimulating and astringent type and by all known measures of influencing the disease through the general system to keep the disorder at a minimum. Under such a regimen the patient must be apprised at the beginning of treatment that cure is not anticipated, that a long period (probably of several years' duration) of therapy is required and that only in the event that the disease is causing pronounced cosmetic difficulties will roentgen treatment be administered. The recent article by Nichols [45] demonstrated that such a method is attended by satisfactory results, to which I can testify from an extended experience. The success of this program is dependent in no small degree on the psychologic influence of the physician.

On the other hand, in patients from 18 to 22 years of age irradiation is probably the method of choice. Relapses are less frequent than in the earlier age group and in instituting roentgen therapy one is in many cases but aiding and anticipating the natural tendency of the disease to disappear about this time of life. For this reason, I use irradiation practically as a routine measure for patients who are in this age group if the severity of the disease justifies it.

Patients in the middle twenties and older, however, present a somewhat different therapeutic problem. In many cases the disease has continued since adolescence, in others it begins in this relatively late period. Among the former are many cases in which the endocrinal upset initiated by puberty has not been adjusted normally; while in others, systemic disturbances (pelvic disease, gastro-intestinal disorders) appear to be primary etiologic factors. Proper management in this group must comprise an industrious search and eradication, if possible, of all suspicious contributing factors. Among these patients, in my experience, are found a large number that fall into the intestinal type of von Leszczynski and Liebhart. Radiation therapy apparently is more helpful to these patients than to the younger ones. It is a poor policy, however, to depend on it rather than to make a diligent effort to ferret out and attack the many possible and important contributing causes.

CONCLUSIONS

1. Acne vulgaris is a syndrome the cause of which is a complex of various interacting factors. In juvenile patients the physiologic activity of the gonads appears to be the most important factor. In older patients minor functional and organic disorders apparently (but not indisputably) play a definite rôle in the causation.

2. The recent tendency to depend less on roentgen therapy and more on general and local measures should be encouraged. While the roentgen ray is the most certain means of eradication of the lesions, recurrences are too frequent to make this treatment entirely satisfactory.

3. In juvenile patients recurrences are especially frequent and for this reason it is believed that the roentgen ray should not be used except under unusual circumstances.

4. For older patients, especially those between 18 and 25, roentgen therapy is the method of choice. It should be supported by an industrious search for and attention to any probable etiologic factors.

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Incomplete Proteins.—In order that food proteins may be transformed into the proteins of body tissue, they must first be resolved in the digestive tract into their component amino acids. It is in the form of their amino acids that the food proteins are absorbed from the digestive tract and distributed to the various active tissues of the body, where they may be used as needed in new combinations characteristic of the species and of the particular tissue. Some of the amino acids are convertible into each other and so need not individually be furnished by the food proteins. But several individual amino acids contain characteristic chemical structures or groupings which the body cannot obtain from other sources nor manufacture for itself and so a food protein lacking in one or more of these "nutritionally essential" amino acids is, when taken by itself, an "incomplete" protein from the nutritional point of view. Gelatin and one of the proteins of maize belong in this group.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

DINITROPHENOL IN THE TREATMENT OF OBESITY

FINAL REPORT

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Since our first report on the metabolic stimulant action of 2-4 dinitrophenol (alpha)[1] in animals and men, and a preliminary paper indicating clinical possibilities for this compound,[2] its use has been continued in the outpatient department of the Stanford Clinics and in private practice. Some of the early clinical results in obesity were summarized in a progress report.[3] Various clinical reports have detailed the actions of the drug under different dietary conditions,[4] its circulatory effects,[5] changes in blood cholesterol,[6] and effects on the icteric index and van den Bergh test.[7] The evidences for changes in blood cholesterol, liver damage and certain red blood cell characteristics were negative. Our experimental work and clinical experience with the drug has now extended over a period of four years, during which time it has been given to hundreds of patients. Therefore it is felt that there may be offered now definite conclusions as to its effects in the treatment of obesity and its value in the therapeutic armamentarium. The experimental results have been summarized in several previous publications [8] and all but the most recent clinical data in a recent review.[7] In this report we will refer only to those clinical articles not discussed in previous publications and those which bear directly on the questions discussed. Time and space will not permit a discussion of the numerous articles that have already appeared in many journals and languages.

PATIENTS STUDIED

The total number of patients studied was 177. All complained of excess weight. Seven of them were seen only once and could not be included in the series. This left 170, of whom twenty were men and 150 were women. Ninety-nine of the patients received no previous treatment, twenty-six had tried only diet, seventeen had taken only thyroid, and twenty-eight had taken both diet and thyroid. In addition, six patients had taken whole pituitary and ovarian substance by mouth. Those patients who had received previous treatment either had failed to lose weight on it or were showing no further losses at the time dinitrophenol was given. All the patients have been included in the average figures regardless of whether they were cooperative or not, or of the duration of treatment with dinitrophenol. They were not a selected group, aside from their obesity, and hence represented a cross-section of cases as seen in ordinary practice. We have attempted to show not the very best statistical results that might be obtained with dinitrophenol in selected patients but rather average effects, such as any practitioner might be able to duplicate.

DIETARY CONTROL

In order that a regimen for weight reduction may be effective, there must be some control of the diet, so as to avoid an excessive intake of food. Because of the special approach to the present problem, no attempt was made to control rigidly the diet of the patients when on dinitrophenol. Those who were already on a fixed diet were instructed to stay on that diet. The remainder were instructed about the rôle of food intake in the production of obesity and requested to take no more food than they had been previously taking. However, no patient was required to adopt a fixed weighed diet of low caloric value. If this had been required, the losses in body weight would have been greater.

TABLE 1.—*Effect of Dinitrophenol on the Basal Metabolic Rate*

Dose, Gm.	Number of Determinations	Average Metabolic Rate, per Cent	Range, per Cent
Control	37	+ 0.2	−27 to + 19
0.1	1	+13	
0.2	10	+20	− 6 to + 88
0.3	16	+31	+ 7 to + 66
0.4	16	+50	+22 to + 83
0.5	8	+56	+ 7 to +107

ADMINISTRATION OF DINITROPHENOL

The sodium salt of dinitrophenol has been used exclusively, except for a few months in the beginning of the studies. The drug was of the highest purity obtainable from commercial sources, but before use its purity was verified, and it was further purified by recrystallization if necessary. No product was used that did not melt sharply between 296 and 298 C. (uncorrected) and was not colorless in acid solution. In determining the melting point it was necessary to dry it first in a desiccator and to heat as rapidly as possible to 285 C. and then very slowly from that point on. An occasional sample would explode at a few degrees below the melting point. Control of the purity is important, since commercial samples of the drug of supposed highest purity have been found by us grossly contaminated and unsafe for medicinal use. It is conceivable that some of the untoward effects reported by others may have been caused by an impure or contaminated drug.

The drug was administered in capsules containing 0.1 Gm. of sodium dinitrophenol, taken with meals. In general, the dosage was started with 0.1 Gm. daily during the first week and then increased to 0.2 Gm. daily.

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After a period of several weeks, during which the symptomatic response and rate of weight loss were ascertained, the dose was increased in 0.1 Gm. steps until either the symptoms or the loss of body weight indicated no further change in medication. It was attempted to keep the weekly rate of weight loss between 2 and 3 pounds (900 and 1,300 Gm.).

More than 50,000 capsules have been administered in this study, or an average of about 300 capsules per patient. The average duration of treatment for the entire series was eighty-eight days per patient, with an average dose of 3.4 capsules or 0.34 Gm. daily. The longest period of treatment for any one patient was one year, and the highest dose taken was 0.8 Gm. The latter dose was taken by a physician on his own responsibility. The highest dose prescribed by us was 0.6 Gm. and this only for short periods in patients previously medicated at lower dosage levels.

TABLE 2.—*Ratio Between Dosage and Rate of Loss of Body Weight*

Dose, Gm.	Number of Patients	Total Number of Days	Average Number of Days per Patient	Total Weight Loss, Pounds	Average Weight Loss, Pounds per Patient Weekly
0.1	37	516	14	60	0.94
0.2	145	3,503	24	637	1.28
0.3	154	4,718	31	894	1.33
0.35	10	739	74	166	1.59
0.4	95	3,765	40	697	1.30
0.5	34	1,417	42	237	1.17
0.6	10	472	47	149	2.21
0.7	1	16	16	7	3.08
0.8	1	7	7	3	3.00

METABOLIC LEVELS

Unfortunately, the cost of basal metabolism determinations prevented us from following the metabolic rates continuously in all patients. However, a total of eighty-eight determinations was made, distributed over the various dosages so as to give reasonably reliable information on the degrees of metabolic stimulation produced.[9] It can be seen from table 1 that the average increase in metabolic rate was roughly proportional to the dosage of the drug. There was on the average about an 11 per cent increase in the basal metabolic rate for each 0.1 Gm. of the daily dose, although the variations in individual patients were rather wide. This difference in susceptibility makes it highly desirable to individualize the dosage and treatment according to the regimen already described. A factor that modified the absolute rises obtained was the use of the smallest dose that would cause the desired therapeutic response. As a result, the more sensitive patients were given only the lower doses, while the higher ones were administered only to resistant patients. Hence the metabolic rates in table 1 do not indicate the average responses that might be expected from the same doses given to an unselected group of patients. They indicate rather an average response considerably below the unselected one.

WEIGHT LOSS

Five patients treated for only short periods lost no weight or actually gained 1 or 2 pounds (450 or 900 Gm.). Weight reduction was obtained in the 165 remaining patients. The largest reduction of weight in any one patient was 82 pounds (37.2 Kg.) in 198 days, or 2.9 pounds (1,315 Gm.) weekly. The entire group lost a total of about 1½ tons in weight. The average total loss per patient was 17.1 pounds (7.8 Kg.), which, when calculated for the average duration of treatment, amounted to a loss of 1.4 pounds (635 Gm.) weekly. Since this average value included the preliminary periods for each patient, when adequate dosage was not being given, it is seen that a satisfactory rate of weight loss was maintained.

In table 2 the weight losses are segregated according to doses. The same difficulty of correlation arose as with metabolic rates. That is, since only the resistant patients were given the higher doses, increases in loss of weight appeared not to result regularly from increased levels of dosage. This lack of correlation was obviously an artefact due to the procedure used for controlling dosage levels, since it was our constant experience that patients who lost at a given rate on a low dose could be made to lose faster when the dosage was increased.

Questions that often arise are whether more rapid losses of weight are produced in patients not previously treated, and whether those known to be resistant to other therapy can be effectively treated with dinitrophenol. In order to answer these questions the data have been arranged in table 3 according to whether the patients had been previously treated with diet or thyroid, or not at all. It can be seen that those not previously treated received about the same average dose as those who had been previously treated with thyroid or diet, or both. All the groups lost weight at about an equal rate, except those who had previously failed to respond to combined thyroid and dietary control. The latter were more resistant to the dinitrophenol than the others, but still they lost more than a pound weekly during an average of 111 days. This gave an average loss of over 16.2 pounds (7.3 Kg.) for each patient, as compared to the 17.1 pounds for the whole series. In other words, each patient lost about the same total weight, but at a slower rate.

SYMPTOMS

It was an almost invariable experience that a therapeutically effective dose of dinitrophenol produced symptoms of increased heat production, which were noticed by the patient. These consisted usually of a sensation of warmth with increased perspiration, sometimes sufficient for discomfort. In a few individuals there was some dyspnea on exertion, due presumably to an increased need for oxygen. A few patients had sensations of languor or muscular weakness, but an equal number felt more active and subjectively improved. Two or three, already mentioned, were made so much more hungry that they actually gained weight while under treatment. Others, however, were less hungry than before, so that there was no consistent change in appetite.

TABLE 3.—*Influence of Previous Type of Treatment on the Rate of Response to Dinitrophenol*

Previous Treatment	Number of Cases	Average Daily Dose of Dinitrophenol, Gm.	Average Duration of Dinitrophenol, Days	Average Loss, Pounds per Week
No diet or thyroid	99	0.32	82	1.45
Only thyroid.....	17	0.33	80	1.47
Only diet.....	26	0.35	91	1.55
Diet and thyroid together.....	28	0.33	111	1.02

9. We are indebted to Miss Elizabeth Hines for assistance in these determinations.

The patients were urged to drink liberally of water, since otherwise the large volumes of fluid lost by sweating resulted in too highly concentrated urines. The high water intake also helped to maintain the volume of the perspiration and thus to dissipate the excess heat production without significant increase in body temperature. Distressing symptoms of excessive heat production were most pronounced in patients given larger doses without adequate preliminary building up of tolerance by means of slowly increasing doses. It appears reasonable to assume that physiologic adaptations can be made to the increased heat production just as in case of changes in external temperature. By allowing adequate time for such adaptation, the sensations of heat are minimized and the patient's comfort is increased.

BLOOD CHANGES

Several case reports have appeared recently,[10] indicating that dinitrophenol may cause attacks of agranulocytosis. Animals [8] have failed to reveal any evidences of alterations in the red or white blood cells even when extratherapeutic doses of dinitrophenol were given for periods of six months. None of these 170 patients developed agranulocytosis or any condition that could be ascribed to a reduction in leukocytic activity.

TABLE 4.—*Effect of Dinitrophenol on Red and White Blood Cells*

	Red Blood Cells, Millions	Hemoglobin, per Cent	White Blood Cells, Thousands	Polymorphonuclear Leukocytes, per Cent	Small Lymphocytes, per Cent	Large Mononuclears, per Cent	Transitionals, per Cent	Eosinophils, per Cent	Basophils, per Cent
Before medication									
Average	5.0	91	7.3	54	38	5.6	0.6	2.1	0.3
Range	(4.3-5.7)	(78-93)	(4.7-10.5)	(43-59)	(25-48)	(2-11)	(0-3)	(0-4)	(0-1)
During medication									
Average	5.1	88	8.5	58	35	4.3	0.6	1.9	0.5
Range	(3.8-6.1)	(72-97)	(4.1-15.9)	(36-90)	(7-61)	(0-11)	(0-3)	(0-8)	(0-3)
After medication									
Average	4.7	93	7.3	65	31	2.0	0	1.3	0.3
Range	(3.7-5.4)	(75-106)	(5.4-8.8)	(60-72)	(26-35)	(2-4)	(0-0)	(0-2)	(0-1)

Nevertheless, when this possibility was first suggested, blood counts were made on all the available patients under treatment with dinitrophenol, as well as on those who had already completed their therapy. A total of sixty-two cases were thus studied, including eight new patients in whom counts were also made before administration of the drug. The average results, together with maximum and minimum values, are shown in table 4. It can be seen that the values for red cells and hemoglobin have a normal distribution.

This is in agreement with our previous results. The leukocyte count during dinitrophenol administration averaged 8,500 cells per cubic millimeter, and the lowest count was only 4,100, all of which is well within normal limits. Differential counts also gave no indication of a decrease in production of polymorphonuclear leukocytes. Therefore, the influence of the drug on the blood picture as observed in this series may be regarded as entirely negative.

There still remained the possibility that there might be some small progressive change which might be masked by the method of averages used. Therefore the data were rearranged according to the total amount of dinitrophenol taken by each patient up to the time the blood count was made. If dinitrophenol interfered with leukocyte production, a mechanism of agranulocytosis, there should be some evidence of a progressive shift in the white cell counts as the total dosage increased. In table 5 the patients are divided into four groups according to the total dose of dinitrophenol each one had taken. For the sake of simplicity, the irrelevant counts have been omitted from the table.

It is obvious in table 5 that there is a lack of evidence of a progressive decrease in the white cell count or polymorphonuclear percentage as the total dose of dinitrophenol increased, even though very considerable amounts of the drug had been taken, especially in the last group.

Hence it is concluded from these observations of a rather large series of patients that dinitrophenol did not affect the blood cells, contrary to the assertions of others. At the same time we cannot deny the existence of the changes observed by others under their different conditions. It appears certain that agranulocytosis is not necessarily a constant or even a probable resultant of proper medication with dinitrophenol; at least, it is not due to a direct action of the drug. The occurrence of this rare disease is probably the manifestation of some preexisting idiosyncrasy or defective constitution in the individual patient, in whom dinitrophenol or any other drug or toxin may act merely as a precipitating agent.

BLOOD PRESSURE AND PULSE RATE

Blood pressure and pulse rate changes were carefully observed in seventy-six of these patients. Control readings (before medication) were obtained on three different days, the median of three or more readings obtained on each day being used. The patients were arbitrarily divided into a hypertensive group (those with a systolic blood pressure above 150 mm. of mercury) and a normal group. There were thirty patients in the former series and forty-six in the latter. In the normal group the fall of systolic blood pressure averaged 9.4 per cent, with a range of from a 15 per cent increase to a 28 per cent decrease. In the hypertensive group the effect was greater both in absolute values and in percental changes, since the average fall was 12.6 per cent, with a range of from a 3 per cent increase to a 38 per cent decrease. Patients already hypotensive showed little or no further decrease in blood pressure. The fall in diastolic pressures of the normal group averaged 10.6 per cent, with a range of 28 per cent increase to 33 per cent decrease. In the hypertensive group, the average diastolic pressure fell 11.7 per cent, with a range of from 25 per cent increase to 43 per cent decrease. The pulse rate changed in both groups less than 5 per cent and hence was practically unaltered.

From these results it appears that dinitrophenol had little or no direct effect on the systemic blood pressure

10. Hoffman, A. M.; Butt, E. M., and Hickey, N. G.: Neutropenia Following Amidopyrine, J. A. M. A. **102**: 1213 (April 14) 1934. Davidson, E. N., and Shapiro, M.: Neutropenia Following Dinitrophenol, With Improvement After Pentnucleotide and Leukocyte Cream, J. A. M. A. **103**: 480 (Aug. 18) 1934. Silver, Solomon: A New Danger in Dinitrophenol Therapy, J. A. M. A. **103**: 1058 (Oct. 6) 1934. Dameshek, William, and Gargill, S. L.: New England J. Med. **211**: 440 (Sept. 6) 1934.

and that such changes as occurred were probably due to loss of body weight. Many obese and hypertensive patients showed no fall in blood pressure, even after large losses of weight. This maintenance of elevated blood pressure, in spite of weight loss, was most frequent among those individuals whose original systolic pressures were 200 mm. of mercury or more. While loss of weight is therapeutically indicated in obese patients with hypertension, it cannot be guaranteed that every individual receiving dinitrophenol will obtain a complete result; i. e., both fat and blood pressure reductions.

SIDE ACTIONS

No toxic symptoms occurred in patients taking a daily dose of less than 300 mg. of sodium dinitrophenol. Therefore the group in which reactions occurred was a smaller one, composed of 100 patients who took this dose or more for at least six weeks. Some kind of a side action occurred in twenty-eight patients in this high dosage group. The two most troublesome symptoms were skin rashes and peripheral neuritis. Either of these reactions demands immediate withdrawal of the drug, but neither form a permanent contraindication to dinitrophenol therapy. It was exceptional to find either complication recurring in the same patient.

Skin reactions occurred in twenty-three of these patients. One third of them consisted only of transient itching without a rash. In the remainder there were both pruritus and visible skin lesions, either urticarial or maculopapular in character. The urticarial lesion was about twice as frequent as the maculopapular. After the early days of this study, the patients were warned to discontinue the drug at the first indication of itching or skin rash, since which time none of the lesions have progressed beyond the maculopapular stage, and the incidence of severe skin manifestations has fallen to zero. In a number of instances the skin reaction disappeared spontaneously in spite of the continued administration of the drug. In two patients who continued taking dinitrophenol after the appearance of urticaria, alarming symptoms of systemic poisoning developed. One of these patients had a known allergy toward strawberries, and her skin reaction followed promptly on the eating of a bowl of this fruit at the beginning of the season. It is a question in her case whether the dinitrophenol had any causative rôle in this skin reaction or perhaps merely aggravated it. The symptoms in both patients seemed referable to increased capillary permeability, with escape of fluid into the tissues. Massive urticarial wheals covered the body, and extensive localized edematous collections appeared in various regions. Complete anuria persisted over a period of twenty-four hours, although the first specimen of urine voided showed no albumin, sugar or abnormal microscopic elements. The temperatures were elevated in the allergic case up to 103 F. and in the other case to 101 F. The subjective complaints were itching and burning of the skin, great weakness and prostration, and faintness on exertion. The acute discomfort abated after seventy-two hours, although neither patient was able to leave bed for a week. Treatment of these severe skin reactions was limited to bed rest, forced fluids and cooling local applications. Hypodermic administration of epinephrine afforded temporary relief from the pruritus and urticaria. Neosynephrin in oral doses of 0.1 Gm. every two hours gave no relief. This type of skin reaction has been discussed previously by us [7] and in a number of publications by others [11] and need not be considered further here.

Exacerbation of a preexisting epidermophytosis was observed in four patients. The rapid spread was doubtless due to the increased sweating, which tended to keep the skin moist and macerated. A similar observation has been reported by Faddersbøll.[12]

Some manifestation of peripheral neuritis occurred in eighteen patients. Most commonly affected were the legs and feet (thirteen patients), but the arms and fingers were involved in ten patients and the tongue in five. Effects on the tongue were manifested by loss of taste, especially for sweet and salt, and numbness and tingling. A similar result has been reported by Hunt.[13] In the extremities, the symptoms consisted of various paresthesias, such as numbness, "pins-and-needles," and heat and cold. Perception of painful stimuli was increased, but there was a definite delay in the conduction time. In only one case was motor weakness present, as shown by decreased tendon reflexes and partial foot drop. This weakness disappeared entirely one week after dinitrophenol had been discontinued. The sensory changes, as a rule, cleared up more slowly, after an average period of three weeks. In one case, symptoms persisted for two months. The changes in peripheral nerves came on so slowly that no difficulties were encountered in diagnosing them, or in stopping the drug before significant damage had occurred. After a recovery period, the patients usually resumed treatment of a lower dosage level without further symptoms.

TABLE 5.—*Relation of Total Dinitrophenol Dosage to White Blood Cell Counts*

Total Amount Taken, Gm.	White Blood Cells, Thousands	Polymorphonuclear Leukocytes, per Cent	Small Lymphocytes, per Cent	Large Mononuclears, per Cent
Controls before dinitrophenol...	7.3	54	38	5.6
0.1 - 30.....	7.9	58	34	4.9
30.1 - 60.....	8.9	58	37	3.4
60.1 - 90.....	8.2	56	36	4.1
90.1 -198.....	8.9	56	37	3.2

COMMENT

The results obtained by us leave no doubt that dinitrophenol can be administered to almost all obese patients with the object of producing a loss of weight. This is in agreement with previous reports by us and with the experiences of many others.[14] Grant and Schube,[15] however, failed to observe a consistent loss of weight in a group of fourteen patients in whom they were studying the effect of dinitrophenol on the blood cholesterol, and Andersen [16] did not find a greater rate of loss of weight in his patients already losing on a 1,000 calory diet, when they were given dinitrophenol in addition. Other than these two ostensibly negative reports there has been no serious denial of the fact that increasing the basal metabolic rate by dinitrophenol must result in a loss of body weight unless this is compensated for in some way.

11. Quick, A. J.: Dangerous Drug Reactions, correspondence, J. A. M. A. **102**: 1419 (April 28) 1934. Bortz, E. L.: Ann. Int. Med. **8**: 599 (Nov.) 1934. Beinhauer, L. G.: West Virginia M. J. **30**: 466 (Oct.) 1934. Gimsing, T.: Ugesk. f. læger **96**: 527 (May 17) 1934.
12. Faddersbøll, H.: Nord. med. tidskr. **8**: 1088 (Aug. 25) 1934.
13. Hunt, W. D.: Northwest Med. **33**: 209 (June) 1934.
14. Tainter, Cutting and Stockton.[7] Faddersbøll.[12] Hunt.[13] Secher, K.: Ugesk. f. læger **96**: 192 (Feb. 15) 1934. Bayer, Leona M., and Gray, Horace: Am. J. M. Sc. **189**: 86 (Jan.) 1935. Also references given in footnote 11.
15. Grant, L. F., and Schube, P. G.: J. Lab. & Clin. Med. **20**: 56 (Oct.) 1934.
16. Andersen, W. T.: Ugesk. f. læger **96**: 521 (May 17) 1934.

Our experience has established the further fact that dinitrophenol will promptly and certainly raise the rate of metabolism in a way and to an extent not approached by any drug previously tried. Therefore, dinitrophenol represents a new and powerful metabolic reagent available for therapeutic experiments and for clinical use. It has, however, the disadvantage of producing in some patients undesirable side actions, which are unpredictable and occasionally alarming. These reactions have occurred mainly in patients receiving large doses of the drug over long periods of time. Attention to the following details should reduce the incidence of undesirable reactions and toxicity to negligible proportions: purity of the drug, slow increase in dosage, maintenance of adequate fluid intake, and prompt discontinuance of the drug on the first hint of an undesirable reaction.

Dinitrophenol should not be used as a routine reducing agent for all cases. Each patient should be handled as an individual problem, those measures being used first which are potentially least harmful. Therefore no patient should be given a drug for the purpose of reducing weight until it is clearly established that dietary measures alone cannot be used successfully, whether by reason of economic or psychic inability to diet properly or because of need for more hurried reduction. In case the patient suffers from hypothyroidism, that fundamental defect should be treated with thyroid as well. Only when these measures fail or cannot be applied should treatment with dinitrophenol be instituted. Treatment with dinitrophenol should therefore constitute the "court of last appeal," where it will be found almost always effective.

CONCLUSIONS

1. One hundred and seventy unselected obese patients were given sodium dinitrophenol (2-4) by mouth for an average of eighty-eight days each, in an average daily dose of 0.34 Gm.

2. The average increase in metabolic rate was about 11 per cent for each 0.1 Gm. daily dose.

3. The average loss of body weight was 17.1 pounds for each patient, with an average rate of loss of 1.4 pounds weekly. Patients resistant to dietary or thyroid measures lost weight as well as those previously untreated, but patients who had resisted combined dietary and thyroid therapy lost less rapidly on dinitrophenol than the other groups.

4. The main symptoms of therapeutically effective doses of dinitrophenol were those of extra heat production; namely, sweating, flushed skin, concentrated urine, and sensations of warmth. These symptoms could be controlled to some extent by building up the dosage gradually to the therapeutic level and by ensuring adequate fluid intake.

5. No evidence was obtained in these patients that dinitrophenol affected the blood cells, as shown by blood counts and clinical observations.

6. Side actions, consisting of skin rashes or peripheral nerve changes, were observed in about one fourth of the patients receiving high doses, or in about one seventh of the entire series. These side actions may be largely avoided by stopping medication promptly on the first appearance of any of these changes.

7. Dinitrophenol is a highly effective drug for increasing the metabolic rate and reducing excessive body weight. Medication with this drug is probably indicated in the present state of our knowledge mainly in those cases in which other potentially less toxic means of treatment cannot be successfully applied. For those obese patients who are resistant or unsuited to other therapy, dinitrophenol is a potent and valuable therapeutic agent.

Sacramento and Webster streets.

ABSTRACT OF DISCUSSION

DR. MAURICE BRUGER, New York: Dr. Tainter and his associates have shown that the increased production of heat following the ingestion of dinitrophenol is derived from the combustion of fat rather than carbohydrate. Their studies on the excretion of nitrogen in the urine following the administration of dinitrophenol indicate that protein catabolism is not accelerated. It should be pointed out, however, that determinations of the respiratory quotient after the use of dinitrophenol have not given uniform results: some workers have reported a definite increase in the respiratory quotient, indicating an increased oxidation of carbohydrate, while others have corroborated the results of Dr. Tainter and his co-workers. Drs. Cameron V. Bailey, George C. Thosteson and I determined the production of heat in five obese women before and after the administration of dinitrophenol. The respiratory exchange was determined by a modified Tissot method, and the urinary nitrogen content by the Kjeldahl procedure. Our work revealed that (1) the administration of dinitrophenol in doses of 3.5 mg. per kilogram increased the total production of heat commensurate with that found by other workers—approximately 40 per cent in from three to four hours, (2) the increased production of heat was derived from the accelerated combustion of both fat and carbohydrate, (3) protein catabolism was definitely spared and (4) appreciable quantities of carbohydrate were burned after the administration of dinitrophenol even though under basal conditions carbohydrate was absent because of previous dietary restrictions. The oxidation of carbohydrate arising from stores partially depleted of this fuel is further evidence of the glycogenolytic action of dinitrophenol. In view of these observations the suggestion is offered that during dinitrophenol therapy an adequate intake of carbohydrate should be allowed, as a safeguard against depleting the store of glycogen in the liver and other tissues, and in order to offset some of the toxic manifestations of the drug.

DR. FRANK A. EVANS, Pittsburgh: A study of dinitrophenol in obesity made recently in Pittsburgh confirmed Dr. Tainter's published statements. In other words, dinitrophenol is a drug that increases the basal metabolism and therefore is useful in any clinical condition in which that result is desirable. I question seriously whether obesity is one of those clinical conditions. The oxygen exchange in an obese person is already elevated. Indeed this elevation of metabolism is probably a large factor in the physiologic strain of obesity that makes it such a menace to continued good health. The indication in obesity is not for an increased oxygen exchange but for a diminished intake of energy. Possibly dinitrophenol has a specific effect in fat metabolism. In my opinion this has not been shown. The fact that in the reduction of weight by means of dinitrophenol fat predominantly is burned is not evidence of specificity. Reduction in weight by dietary limitation alone, but in which essential foodstuffs are given in adequate amounts, is at the expense of fat tissue. The caloric deficit to be obtained with safe doses of dinitrophenol is not more than could be obtained by removing from the diet two pats of butter at each meal. If an obese patient will not make such a minor reduction in dietary intake as that, I doubt whether it is worth while to obtain a reduction by any method, as after discontinuation of the drug he will probably become as fat as ever. Of the authors' statements the one I can confirm most emphatically is the closing one that the use of dinitrophenol is not the method of choice in the treatment of obesity.

DR. MAURICE L. TAINTER, San Francisco: The amount of fuel burned by dinitrophenol fluctuates since the respiratory quotient can be shown to vary with the degree of muscular

activity. Under resting conditions fat is the main source of extra energy, but carbohydrate and protein also may be burned if conditions are changed. Dr. Evans is correct in saying that the use of dinitrophenol is not the method of first choice in the treatment of obesity; it is the method of last choice, the method to use when nothing else is effective and when the need for reduction is sufficiently great to justify the admittedly definite risks of the dinitrophenol medication. After this paper was prepared for publication, cataracts developed in one of the patients in the series. They came on acutely six months after she discontinued the use of the drug. It is not possible to decide at present whether such an occurrence is related to the drug, to the restricted or unbalanced diet so commonly used by such patients or to other causes.

CORONARY ARTERY THROMBOSIS

WITH TREATMENT BY PROLONGED REST IN BED AND LOW CALORY DIET; IMPROVED PROGNOSIS

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The prevalence and grave significance [1] of heart disease are being emphasized. Nearly 2,000,000 people in this country are suffering from the disease, and deaths from this cause have taken first rank, 224 per hundred thousand of population having been reported for the year 1932. The mortality rate in heart disease is more than twice as high as that in cancer, its nearest rival. These figures should not arouse undue apprehension, for it has been pointed [2] out very clearly that they are the result of "beneficent" causes; namely, the longer life span and the lowered incidence of infectious diseases, tuberculosis, and the like. Nevertheless, even the more cheerful writers report that heart muscle disease is markedly on the increase, not only in old age but in the years between 25 and 44. Yet, I shall paint an optimistic picture, in spite of the fact that the most serious of the heart muscle diseases, namely, acute coronary artery occlusion, is my subject.

Many clinicians [3] have reported the mortality rate from coronary thrombosis as being between 35 and 65 per cent, averaging about 50 per cent. These results are based on the attacks studied, no matter whether they happened to be the first, second or third. Conner and Holt [3] gave the first intimation that the death rate following the initial attacks of coronary artery occlusion was much lower than that occurring as a result of later attacks. They found the death rate in the first attack to be 16 per cent.

This paper contains a summary of an investigation of my private cases. The patients were treated either by me alone or in conjunction with the family physician. In this series have been included all the deaths that occurred, even though some of the patients died before they could be placed on a low (800) calory diet.

1. Dublin, L. I.: The Problem of Heart Disease, Harper's Magazine **154**: 196, 1927. Cohn, A. E., and Lingg, Claire: Heart Disease from the Point of View of Public Health, Am. Heart J. **9**: 283 (Feb.) 1934. Stone, C. T.: The Mortality from Heart Disease: A Challenge, J. A. M. A. **103**: 151 (July 21) 1934.

2. Bolduan, C. F., and Bolduan, N. W.: Is the "Appalling Increase" in Heart Disease Real? J. Prev. Med. **6**: 321 (July) 1932. Cohn and Lingg.[1]

3. Parkinson, John, and Bedford, D. E.: Cardiac Infarction and Coronary Thrombosis, Lancet **1**: 4 (Jan. 7) 1928. Conner, L. A., and Holt, Evelyn: The Subsequent Course and Prognosis in Coronary Thrombosis: An Analysis of 287 Cases, Am. Heart J. **5**: 705 (Aug.) 1930. Levine, S. A.: Coronary Thrombosis: Its Various Clinical Features, Medicine **8**: 245 (Sept.) 1929. Coombs, C. F.: Prognosis in Coronary Thrombosis, Bristol Med.-Chir. J. **49**: 277, 1932.

CRITERIA FOR DIAGNOSIS OF CORONARY THROMBOSIS

The diagnosis was certain in all the patients who survived. Coronary thrombosis, when classic, is an easy diagnosis to make. There were severe pain in the chest, particularly substernal; signs of shock, such as grayish pallor, perspiration, feeble pulse, clammy extremities and collapsed veins; a drop in blood pressure; changes in heart sounds; a pericardial rub (if present); a rise in temperature; leukocytosis and, above all, characteristic signs in the electrocardiogram.[4] (That is, characteristic elevations and depressions of RS-T transitions with T wave inversions and Q wave changes.)

In a series of eighty-five attacks of coronary thrombosis, occurring in seventy-five patients, the mortality rate was between 9 and 11 per cent. The death rate following first attacks was less than 2 per cent. These figures are the lowest reported yet. The observations and results have been placed in tabular form (table 1).

METHOD OF TREATMENT

Immediate rest in bed was instituted. When, occasionally, a patient suffered an attack away from his home, he was very carefully transported there or to a hospital. If he was in shock he was kept in bed at the place where he was first seen, if possible.

For the first twenty-four, forty-eight or even seventy-two hours of an attack the patient was given very little food, particularly if he was in shock. Food was never urged on a patient. If nausea and vomiting were present, sips of cold White Rock or Seltzer or Vichy water or bits of cracked ice were offered. Usually absolute rest for the stomach is advisable. Tea, toast, fermented milks, buttermilk and strained vegetables are added gradually. The patient himself will often suggest a food that will relieve his nausea, or at least not aggravate it. Sodium bicarbonate alone or in combination with bismuth subnitrate, and minute doses of peppermint were occasionally dispensed for the nausea or vomiting.

On the first, second, third or fourth day, depending on the condition of the stomach, the patient was placed on a 750-850 calory diet and remained on it until he was ready to leave his bed. It was a well balanced diet [5] (approximately 80 Gm. of carbohydrate, 50 Gm. of protein and 30 Gm. of fat) containing vitamins and adequate calcium (table 2).

The patient remained on an 800 calory diet for at least four weeks, preferably six; but if he progressed very well or if he was hungry, the quantity of food was slowly increased.

The fluid intake was limited to from 1,000 to 1,200 cc., but here again judgment was used. On a hot day, if the patient perspired excessively, he was permitted to have more liquids if he so desired. As a rule, on a low calory diet patients do not become thirsty, particularly since the food is not spicy. Condiments were eschewed. Salt was included only in the cooking and was not placed on the food tray.

The extreme importance of absolute rest was again and again emphasized to the patient, nurse and family. The patient was not permitted to sit up. Likewise he

4. Pardee, H. E. B.: An Electrocardiographic Sign of Coronary Artery Obstruction, Arch. Int. Med. **26**: 244 (Aug.) 1920. Rothschild, M. A.; Mann, H., and Oppenheimer, B. S.: Successive Changes in the Electrocardiogram Following Acute Coronary Artery Occlusion, Proc. Soc. Exper. Biol. & Med. **23**: 253, 1926.

5. This diet is used at the Mount Sinai Hospital in New York and was originated by Miss Adeline Wood, head dietitian, and Miss Ella Coleman, assistant dietitian.

was not allowed to feed himself, particularly during the first week or two. His position in bed was carefully changed from time to time to prevent hypostasis in the lungs.

Day and night nurses were retained even if the family finances were strained thereby. Adequate nursing is of indescribable value. The nurses were there to save the patient's energy, to keep away visitors, and to make all quiet and tranquil. They were enjoined not to do too much—to leave the patient alone, unless they could be of genuine assistance.

Avoidance of infections of the upper respiratory tract is important, as this is a strain on the cardiovascular system, causing a drop in blood pressure and an increase in heart rate. No one who had such an infection was permitted near the patient.

TABLE 1.—*Coronary Artery Thrombosis*

No.	Name	Age	Sex	Thrombosis* No.	Thrombosis* Year	Days Bed	Days Home	Loss of Weight	Economic Restitution	Blood Pressure Previous Systolic	Blood Pressure Previous Diastolic	Blood Pressure Lowest Systolic	Blood Pressure Lowest Diastolic	Number Electrocardiograms	Location of Infarcts Anterior	Location of Infarcts Posterior	First Attack
1	L. A.	63	♂	1	1935	37	40	13	.....	200+	190	134	80	2	T_{1-2}		
2	G. B.	63	♂	1	1928	14	17	..	Complete	148	98	96	58	2	T_1		
3	H. B.	52	♂	2	1933	180	210	..	Complete	250	150	150	90	3	....	T_{2-3}	1933
4	M. B.	42	♀	1	1934	16	16	8	Complete	120	90	90	60	2	....	T_{2-3}	
5	H. B.	47	♀	1	1932	33	53	18	Complete	160	100	88	60	2	....	Q_3T_3	
6	W. B.	40	♂	1	1934	18	18	25½	Complete	140	90	98	60	2	....	Q_3T_3	
7	M. C.	74	♂	1	1935	30	35	13	Partial	170	90	120	80	4	....	$T_{2-3}Q_3$	
8	J. C.	50	♂	1	1932	17	24	4	Complete	150	90	80	50	1	....	T_{2-3}	
9	S. C.	50	♂	1	1932	35	42	15	Complete	140	90	84	60	3	....	T_{2-3}	
10	D. C.	46	♂	1	1934	26	31	10	Complete	130	80	102	66	1	....	T_{2-3}	
11	C.	65	♀	1	1933	80	90	10	Complete	150	90	110	70	1	....	T_{2-3}	
12	H. D.	38	♂	1	1933	39	45	23	Complete	150	106	110	80	3	....	$T_{2-3}Q_3$	
13	H. D.	45	♂	1	1933	33	38	6	Complete	160	100	...	...	1	T_1		
14	.....	45	♂	2	1935	41	48	13	Complete	120	94	90	60	..	T_{1-2}		
15	B. E.	52	♂	1	1934	40	44	10	Complete	150	98	106	74	6	T_1		
16	D. E.	64	♂	1	1934	51	58	12	Comp'ete	135	90	100	60	2	....	T_{2-3}	
17	A. F.	57	♂	1	1929	21	70	11	Complete	235	...	150	90	1	T_{1-2}		
18	D. G.	45	♀	1	1933	63	77	23	Complete	130	...	...	...	..			
19	A. G.	40	♀	1	1933	55	106	25	Partial	200+	110	96	80	5	....	T_{2-3}	
20	G. G.	64	♂	1	1933	56	98	22	Complete	180	110	90	70	4	....	T_{2-3}	
21	H. G.	81	♂	1	1934	5	6	6	Complete	130	80	100	70	1	....	T_3	
22	A. H.	41	♂	1	1935	48	59	12	Complete	130	85	90	60	1	T_{1-2}		
23	G. H.	51	♂	2	1931	51	60	..	Disabled	120	80	90	56	1	....	T_{2-3}	1927
24	L. H.	58	♂	1	1933	60	67	32	Complete	146	100	100	74	2	....	T_{2-3}	
25	I. H.	48	♂	2	1934	24	48	15	Partial	130	80	96	50	2	....	$T_{2-3}Q_3$	1934
26	J. H.	54	♂	1	1929	35	40	10	Complete	124	60	84	56	2	T_1		
27	J. I.	53	♂	2	1933	81	86	13	Partial	140	84	86	60	5	....	T_{2-3}	1933
28	A. J.	40	♂	1	1930	37	46	13	Complete	124	80	80	60	2	....	T_{2-3}	
29	S. J.	52	♂	2	1933	18	40	23	Complete	200	120	100	70	3	T_{1-2}	....	1931
30	K.	64	♂	1	1932	56	56	10	Complete	115	...	90	...	3	T_{1-2}		
31	I. K.	37	♂	1	1934	42	63	12	Disabled	120	...	74	54	2	T_{1-2}		
32	H. K.	40	♀	1	1934	54	68	10	Complete	186	...	72	50	6	....	T_3	
33	.....	40	♀	2	1934	27	30	8	Complete	138	90	94	60	2	....	T_3	
34	S. L.	55	♀	1	1932	42	46	12	Complete	150	110	122	80	..	T_1		
35	P. L.	74	♂	2	1929	21	21	10	Complete	124	72	80	50	2	T_1	....	1920
36	.....	77	♂	3	1932	6	14	5	Complete	130	...	80	50	3	T_{1-2}		
37	E. L.	46	♂	1	1929	61	..	30	Disabled	160	110	80	65	4	T_1		
38	.....	46	♂	2	1929	213	275	25	Disabled	100	60	80	50	4	T_{1-2}		
39	R. L.	69	♂	1	1929	10	20	7	Complete	114	72	80	...	1	T_1		
40	L. L.	52	♂	2	1932	6	16	3	Complete	170	120	100	70	1	....	$T_{2-3}Q_3$	1931
41	L. M.	62	♂	1	1928	42	63	10	Complete	150	120	105	78	3	....	T_{2-3}	
42	B. M.	52	♂	2	1931	91	98	30	Complete	170	110	90	70	5	T_{1-2}		
43	L. M.	50	♂	1	1932	52	82	15	Partial	140	95	...	65	6	....	T_{2-3}	1931
44	D. M.	60	♂	1	1932	61	61	7	Complete	124	76	92	64	1	....	T_{2-3}	
45	I. M.	51	♂	2	1932	50	71	21	Partial	154	100	80	60	2	....	T_3Q_3	1931
46	A. M.	45	♂	2	1928	33	61	16	Disabled	160	110	90	70	4	T_{1-2}	....	1926
47	.....	49	♂	3	1932	91	91	13	Partial	140	90	76	50	4	T_{1-2}		
48	N. N.	51	♂	1	1931	38	48	21	Complete	156	90	102	60	4	....	T_3	
49	.....	54	♂	2	1934	42	50	12	Complete	150	90	90	60	2	....	T_3	
50	.....	54	♂	3	1934	40	47	10	Complete	140	90	92	64	2	....	T_3	
51	A. N.	50	♂	1	1933	41	64	15	Disabled	250	150	100	70	2	T_{1-2}		
52	G. N.	40½	♂	1	1932	42	61	10	Complete	170	120	100	...	1	$T_{1-2}Q_{1-2}$		
53	.....	42	♂	4	1934	42	46	15	.....	170	110	110	80	8	T_{1-2}		
54	J. O.	52	♂	1	1933	21	28	20	Complete	180	110	110	86	1	T_{1-2}		
55	R. P.	52	♂	2	1932	45	61	10	Complete	170	120	100	70	3	T_1	....	1932
56	.....	53	♂	3	1933	42	57	3	Partial	160	100	120	70	3	Q_1T_1		
57	.....	54	♂	4	1934	28	35	20	Partial	130	80	86	60	6	T_1		
58	S. P.	51	♂	1	1934	52	85	15	Partial	174	110	110	70	6	$T_{1-2-3}Q_{2-3}$		
59	F. P.	59	♂	1	1932	56	63	3	Complete	...	...	86	60	1	....	T_{2-3}	
60	S. P.	60	♂	2	1933	25	35	11	Partial	130	90	104	64	1	....	$T_{2-3}Q_3$	1928
61	M. P.	53	♂	1	1930	21	49	10	Complete	150	80	106	68	1	....	$T_{2-3}Q_3$	
62	M. R.	57	♂	1	1931	110	122	15	Partial	...	...	90	...	..	....	Q_3T_3	
63	G. R.	45	♀	1	1935	35	42	18	.....	...	...	90	48	4	....	Q_3T_3	
64	S. R.	54	♂	2	1934	20	20	5	Complete	200	...	132	90	1	Q_1T_1	....	1931
65	R. S.	50	♀	1	1930	35	42	20	Complete	170	100	120	...	1	T_1		
66	A. S.	60	♀	1	1935	28	31	8	.....	190	120	115	74	6	....	T_3	
67	S. S.	66	♂	2	1934	45	45	6	.....	...	...	102	68	1	....	T_{2-3}	
68	A. S.	73	♂	1	1934	45	50	26	.....	170	100	110	70	3	....	T_{2-3}	
69	L. S.	43	♂	1	1933	56	57	10	Complete	...	...	78	50	1	....	T_{2-3}	
70	M. S.	50	♂	1	1933	30	30	10	Complete	...	...	110	70	1	T_{1-2-3}		
71	W. T.	39	♂	1	1928	10	15	15½	Complete	130	80	90	60	5	T_{1-2}		
72	F. T.	65	♂	1	1931	28	49	7½	Complete	140	90	80	...	..			
73	S. W.	48	♂	2	1933	56	80	22	Complete	150	100	84	60	4	....	$T_{2-3}Q_{2-3}$	1928
74	J. W.	42	♂	1	1934	21	21	10	Complete	140	100	100	70	1	$Q_{1-2}T_{1-3}$		
75	F. W.	63	♀	1	1934	13	17	7	Complete	170	100	100	80	1	T_{1-3}		
76	A. Z.	50	♂	1	1933	28	30	6	Complete	154	106	100	70	2	T_1		
77	S. Z.	42	♂	1	1928	35	42	..	Complete	...	...	...	...	2	T_1		
78	L. C.	59	♂	2	1933	Died 6-7 hours			.....	190	100	...	...	..	T_{1-2}†	....	1934
79	K.	64	♀	3	1935	Died 14 hours			.....	200+	...	...	...	..	....	....	1934
80	L. M.	67	♂	2	1933	Died 17 days			.....	150	120	...	...	1	....	Q_3T_3	No. 41
81	I. M.	53	♂	3	1934	Died 4 hours			.....	154	100	...	...	..	....	Q_3T_3†	No. 45
82	A. N.	50	♂	2	1934	Died 2 hours			.....	230	150	...	...	..	T_{1-2}†	....	No. 51
83	J. R.	62	♂	3	1934	Died 8 hours			.....	230	120	...	...	..	....	....	1928
84	M. S.	67	♂	1	1932	Died 14 hours			.....	200+	120+	...	...	..	T_1		
85	L. S.	77½	♂	2	1932	Died 7 hours			.....	190	110	...	...	..	....	....	1931

* Treated by method described in paper.
† Previous electrocardiograms.

I have had no hesitancy in explaining the situation to the patient in a common sense manner. He would be told that he had a wound of the heart and that he must give that organ as little work to do as possible, so that it might heal. It was further explained that physical and mental activity and the partaking and digestion of food entailed added work for the heart by changing blood pressure and pulse rate and stroke output of the heart. Not for a moment, however, was a despondent note struck. In fact, I always assured the patient that he would get well.

The importance of avoiding all irritation and annoyance was made clear. The patient was warned that he was to be the loser in every argument, no matter who was right and no matter how insignificant the point at issue.

The patient was permitted to sit up in from four to six weeks; he was usually in bed for six weeks. Gradually he sat up in a chair, then walked a few steps and made further progress, a little at a time. He was ready to climb steps in from eight to twelve weeks. Patients often required longer periods. Each case was considered on its own data. Rarely, a patient had a return of pain when he first was out of bed, and when this occurred he was promptly put back. On the other hand, many patients felt so well that they insisted on shortening the time in bed.

Only rarely does the sensation of hunger annoy the patient or make him unhappy. Occasionally, particularly in a diabetic patent, the hunger sensation is a problem, but the patient usually becomes adjusted to his diet in a week or two. There are many devices to which one may resort to overcome the pangs of hunger. Clear broth, jellied consommé, tomato juice, and the like have very little caloric value and yet may satisfy the hunger sensation. Furthermore, the patient is advised to eat very slowly and to chew his food well. However, if it appeared that adding 100 or 200 more calories after the first week or two was essential to the patient's comfort, this was done without hesitation.

Digitalis, glyceryl trinitrate, amyl nitrite, epinephrine, and ephedrine [6] were never prescribed. Morphine and codeine were given liberally. For the severe pain of the attack, in a few instances, morphine was given in doses amounting to from three-fourths to 1 grain (0.05 to 0.06 Gm.) hypodermically, within the first twelve hours, or even within the first two hours. During the initial stage of shock, if the condition of the patient was precarious and if the patient required a cardiovascular stimulant, caffeine was injected subcutaneously or intramuscularly. Heat was applied to the extremities if it made the patient more comfortable. An icebag over the precordium occasionally was welcomed.

No laxatives, cathartics or enemas were ordered for the first three to five days; very rarely did abdominal distention become severe enough to indicate their use any sooner. If a patient required codeine over a period of days, sufficient laxatives were given to keep the bowels open without requiring the patient to strain. It is well known that patients may die suddenly from excessive straining at stool.

By means of a portable apparatus, electrocardiograms were taken during all attacks but seven. The average number of records was three per patient.

RESULTS

In all, seventy-five patients were treated in the manner described, beginning in 1928, when the first case was so studied at the private pavilion of the New York Hospital. There were sixty-three male and twelve female patients. The average age of patients who survived the attacks was 53 years and of those who died, 63 years. The average age of the male patients was 54; that of the female, 51 years.

These seventy-five patients had, altogether, eighty-five attacks of coronary thrombosis in which the routine procedures just outlined were followed. The mortality was eight deaths in eighty-five attacks; that is, a rate of 9.5 per cent. Considering only first attacks, the mortality was confined to one patient, or less than 2 per cent, whether on the basis of the number of patients or of the total number of attacks (table 1).

In the seventy-five patients studied, eighteen had two occlusions, six had three, and two had four attacks, making 108 attacks in all. It is obvious that multiple infarctions are common. The length of time of survival of those who experienced more than one attack ranged from one to fifteen years, and of these twenty-six patients only seven have died.

TABLE 2.—*Well Balanced Diet of Low Calory Content*

Breakfast:	1 small serving fruit without sugar
	2 tablespoonfuls of cooked cereal
	1 glass of milk, buttermilk or skim milk
	½ slice of bread or toast
	coffee or tea without sugar or cream
Dinner:	1 cup of broth, if desired
	2 ounces of lean meat or fish or chicken
	½ cup of vegetables
	1 small serving of fruit without sugar
	½ slice of bread
	coffee or tea without sugar or cream
Supper:	1 ounce of pot cheese or 1 egg
	½ cup of vegetables
	½ slice of bread
	1 glass of milk, buttermilk or skim milk

It is important to know how many patients were able to resume their usual work or routine, following a coronary occlusion. Six of the subjects studied sustained coronary occlusions within the last six months, and it is therefore too early to give the final picture of their physical activity. It is to be recalled that there were eight deaths. Fifty-three patients who suffered attacks were able to resume their usual work or routine. (These people were of the middle and the upper class and hence none had to return to hard labor.) Twelve patients were able to resume light or moderate work. Only six of the seventy-five subjects have remained disabled over periods of from one to seven years, and not one of these is bedridden. That so many were able to resume their routine work shows that the heart, if given a chance, will "come back." These results are their own justification for the mode of treatment employed.

The average stay in bed was forty-three days. The length of time indoors averaged fifty-nine days.

On an 800 calory diet it is inevitable that the patient loses weight.[7] In many cases this is desirable, particu-

6. Grollman, Arthur: The Cardiac Output of Man in Health and Disease, Baltimore, Charles C. Thomas, 1932, pp. 178, 183 and 189. Fenn, G. K., and Gilbert, N. C.: Anginal Pain as a Result of Digitalis Administration, J. A. M. A. **98**: 99 (Jan. 9) 1932. Riesman, David, and Harris, S. E.: Disease of the Coronary Arteries, with a Consideration of Data on the Increasing Mortality of Heart Disease, Am. J. M. Sc. **187**: 1 (Jan.) 1934. Hadfield, G.: Cardiac Infarction, Lancet **1**: 189 (Jan. 28) 1928. Parkinson and Bedford.[3] Hubble, Douglas: Angina Pectoris and Coronary Disease, Lancet **1**: 908 (April 26) 1930. Proger, S. H., and Ayman, David: Harmful Effects of Nitroglycerine with Special Reference to Coronary Thrombosis, Am. J. M. Sc. **184**: 480 (Oct.) 1932. Cottrell, J. E., and Wood, F. C.: The Effect of Epinephrine in Angina Pectoris: With Report of a Case, Am. J. M. Sc. **181**: 36 (Jan.) 1931.

7. Master, A. M., and Oppenheimer, Enid T.: A Study of Obesity, Circulatory, Roentgen-Ray and Electrocardiographic Investigations, J. A. M. A. **92**: 1652 (May 18) 1929.

larly if he is overweight. The average loss of weight was 14 pounds (6.4 Kg.). Our patients ranged in weight from 103 pounds to 233 pounds (46.7 to 105.7 Kg.).

Preceding fifty-nine attacks (69 per cent), hypertension was present; that is, if one considers that a systolic of 150 or more and a diastolic of 90 mm. of mercury or more indicates abnormally high blood pressure. Of even more significance is the fact that, of the twenty-six individuals who had more than one attack, at least nineteen had a return of hypertension or showed its presence previous to a subsequent attack. In the treatment, then, following a coronary thrombosis, one object must be to prevent the return of the hypertension either by the administration of drugs or by preventive measures, such as adequate sleep, rest, care of the diet, and loss of weight.

A review of the data (table 1) will disclose that six of the seven who died within twenty-four hours were persons who had had more than one attack of coronary thrombosis. It may therefore be repeated that usually patients do not die in their first attack of coronary thrombosis. Moreover, if the patient survives the first twenty-four hours in any attack, he will probably get over that particular attack.

Emphasis must be placed on the rôle that hypertension plays. All patients who succumbed within twenty-four hours had previously been subject to this disorder. It is therefore apparent that the prognosis is worse in patients who have hypertension.

Of the twelve women in this series, at least ten (83 per cent) suffered from previous hypertension.[7a]

Three patients in four attacks (51, 53, 78, 82) had pulmonary edema, two of whom (51 and 53) survived. Congestive failure, in the ordinary sense, with swollen ankles, ascites, congested lungs and huge liver was rarely seen in these patients. This condition may come on gradually subsequent to the attack. During the initial stage of shock signs of slight liver enlargement or adventitious signs at the lung bases, or both, were seen in at least twelve attacks.

Oxygen tents were used on six patients (37, 38, 51, 79, 81, 82), three of whom lived (37, 38, 51). Many of the patients who were gravely ill, however, improved without the aid of oxygen.

There has been much discussion concerning the prognostic importance of the location of the infarct, whether on the posterior or on the anterior aspect of the left ventricle. Characteristic electrocardiographic[8] Q and T wave changes in lead 1 are indicative of anterior wall injuries and changes in lead 3, of posterior wall injuries of the left ventricle. Twenty-six patients showed the former type and thirty-nine the latter. The prognosis was practically the same in the two locations (table 1).

COMMENT

It is believed that near starvation for the first day or two of an attack is of great value to a patient who has sustained a coronary thrombosis. A similar view is held regarding the subsequent treatment with the 800 calory diet. The physician who comes in contact with an individual who has a coronary artery thrombosis, or even an anginal syndrome, knows that a full meal frequently brings on pain. Heberden[9] knew this as far back as 1768. Roemheld[10] has thoroughly investigated the "gastrocardiac" syndrome and believes that it is caused by distention of the stomach, by elevation of the left leaf of the diaphragm and also by reflex and toxic products of digestion. Babkin[11] recently reviewed the work of the Russian Rosenkov, who stated that after a meal toxic substances are elaborated, causing coronary artery constriction. These substances were not found in the fasting blood of the dog. Wayne and Graybiel[12] emphasize the point made known by Grollman[13] that the work of the heart is increased after a meal. A heavy meal is too much for a heart in which the coronary circulation is already affected.

That a lowered basal metabolic rate decreases the velocity of the blood flow and diminishes the work of the heart has been demonstrated by Grollman[14] and by Blumgart.[15] Jaffe, Dack and I[16] have shown that the basal metabolic rate of a patient placed on an 800 calory diet will fall to —20 and —30 per cent. Hence the further advantages of treatment with a low calory intake.

Blumgart, Levine and Berlin[17] have advocated subtotal thyroidectomy for cases of congestive failure and angina pectoris when they are intractable to the more common forms of treatment. Following the operation, they give their patients small doses of thyroid to maintain a basal metabolic rate between —20 and —30 per cent, such as was obtained by the 800 calory diet. It is therefore possible that this low diet over a period of from three to four months or more may produce results comparable to the more or less permanent effects of subtotal thyroidectomy, obtained by the Boston group.

The low calory diet is not merely a scientific theory, for it has been observed clinically that patients lose their pain more quickly and are less apt to have gastrointestinal complaints. Their vital capacity, blood velocity, venous pressure and blood pressure[18] return more quickly to normal.

Rest in bed lowers the basal metabolic rate, diminishes the work of the heart and gives an opportunity for collateral circulation to form around the infarcted region. I advise keeping the average patient in bed for a minimum of six weeks, but there are many who require months in bed. Each case must be treated according to its signs and symptoms. That sufficient rest in bed is of extreme importance seems beyond dispute.[19]

7a. Dr. Ernst Boas of New York has maintained for years that hypertension is invariably present in women who sustain coronary thromboses.

8. Wilson, F. N.; Barker, P. S.; Macleod, A. G., and Klostermeyer, L. L.: The Electrocardiogram in Coronary Thrombosis, Proc. Soc. Exper. Biol. & Med. **29**: 1006 (May) 1932.

9. Heberden, William: Some Account of a Disorder of the Breast, M. Tr. (College of Physicians), London **2**: 59, 1786.

10. Roemheld, L.: Treatment of the Gastrocardiac Syndrome (Gastric Cardiopathy), Am. J. M. Sc. **182**: 13 (July) 1931.

11. Babkin, B. P.: The "Chemical" Phase of Gastric Secretion and Its Regulation, Am. J. Digest. Dis. & Nutrition **1**: 715 (Dec.) 1934.

12. Wayne, E. J., and Graybiel, Ashton: Observations on the Effect of Food, Gastric Distention, External Temperature and Repeated Exercise on Angina of Effort, with a Note on Angina Sine Dolora, Clin. Sc. **1**: 287 (Nov.) 1934.

13. Grollman: The Cardiac Output of Man in Health and Disease, pp. 95 and 99.

14. Grollman: The Cardiac Output of Man in Health and Disease, p. 264.

15. Blumgart, H. L.: The Velocity of Blood Flow in Health and Disease: The Velocity of Blood Flow in Man and Its Relation to Other Measurements of the Circulation, Medicine **10**: 1 (Feb.) 1931.

16. Master, A. M.; Jaffe, H. L., and Dack, Simon: Low Basal Metabolic Rates Obtained by Low Calory Diets in Coronary Artery Disease, Proc. Soc. Exper. Biol. & Med. **32**: 779 (Feb.) 1935; The Basal Metabolic Rate in a Patient with Coronary Artery Thrombosis When Placed on an 800 Calory Diet, J. Mount Sinai Hosp. **1**: 263 (March-April) 1935.

17. Blumgart, H. L.; Levine, S. A., and Berlin, D. D.: Congestive Heart Failure and Angina Pectoris, Arch. Int. Med. **51**: 866 (June) 1933.

18. These features have been studied at the Mount Sinai Hospital for the last two years and will be published in due course.

19. Halsey, Coombs,[3] White, S. M.: Nonpainful Features of Coronary Occlusion, Ann. Int. Med. **8**: 690 (Dec.) 1934. Levine,[3] Parkinson and Bedford,[3] Riesman and Harris.[6]

The results submitted here are so much better than those previously reported that an explanation of this difference should be offered. Except for an occasional report, previous investigators have not differentiated between the first and subsequent episodes of coronary artery closure. They too would have found decided differences in the mortality rates of the two types. In addition, diagnostic acumen has undoubtedly been sharpened and the patient is now ordered to bed the moment the diagnosis is suspected. Furthermore, there is evidence that the outlook for a patient with coronary artery thrombosis is somewhat better than published mortality rates would lead one to think. This evidence is in accord with the results of this study. White [20] described the case of a man who suffered a coronary thrombosis at 63 and died at the age of 80. In the interim the man performed strenuous feats of physical endurance and died of an apoplectic seizure, with no evidence of heart failure.

SUMMARY

Seventy-five patients in eighty-five attacks of coronary thrombosis were treated by immediate complete rest in bed for six weeks and by a regimen of low calory diet. Eight patients died—only one in a first attack.

Meticulous attention to detail is essential to the management of a patient in an attack of acute coronary thrombosis.

During the initial stage of shock the patient was given very little food.

Low calory diets and small meals prevent dangerous gastro-intestinal-cardiac reflexes or mechanical disturbances; they also lower the basal metabolic rate and diminish the work of the heart. The heart is given an opportunity to heal and to form collateral circulation.

Morphine and codeine were used liberally for severe pain. Glyceryl trinitrate, amyl nitrite, digitalis and epinephrine were considered dangerous.

The prognosis for the first attack of coronary artery thrombosis is considered very good; usually a patient does not die in his first attack.

About 70 per cent of the attacks occurred in hypertensive patients. A hypertension is generally present preceding a subsequent attack.

It is probable that in women a coronary thrombosis takes place only when hypertension is present.

The prognosis is better in cases in which the blood pressure is not high.

The prognosis of patients with infarcts on the anterior or posterior surface of the left ventricle is equally good.

Multiple attacks of coronary thrombosis are common.

A patient who dies within twenty-four hours presumably has had previous attacks of coronary thrombosis and has probably suffered from marked hypertension. If the patient lives through the first twenty-four hours, the chances are he will survive that particular attack.

Congestive failure is usually absent during the first attack of acute coronary thrombosis.

Patients returned to their usual routine life or work following at least 62.5 per cent of the attacks and resumed light to moderate activity in at least 14 per cent.

125 East Seventy-Second Street.

20. White, P. D.: Longevity After Coronary Thrombosis, J. A. M. A. **100**: 233 (Jan. 28) 1933.

PASSIVE IMMUNITY IN INFANTS AND THEIR RESPONSE TO DIPHTHERIA TOXOID

PRELIMINARY REPORT

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The most favorable age at which vaccination against diphtheria should be carried out is a matter of considerable disagreement. It is desirable to obtain immunity at as early an age as possible. In private practice, pediatricians have been recommending such active immunization at the end of the first year. Recently, vigorous public health programs have been advancing the age to 6 months. There are two factors that enter into the question of the advisability of vaccination at this age: (1) the fact that young individuals are poor formers of antitoxin and (2) the fact that a considerable proportion of infants still retain their passive immunity at this age. In a recent publication, one of us [1] has shown that infants under 6 months of age respond to vaccination less favorably than those over this age, in that the percentage immunized is smaller; and, even when immunity is obtained, it is less likely to endure than in the older group. After 6 months, however, the proportion immunized is high, around 95 per cent, and the immunity is persistent. From the standpoint of the age of the individual, therefore, 6 months may be selected as a favorable period for antidiphtheria vaccination.

In both private work and public health programs, however, it is impracticable to do preliminary Schick tests before vaccination with toxoid is carried out. At 6 months of age about half of all babies still retain their passive immunity. In the group at St. Vincent's Hospital, where this problem has been under investigation, 68 per cent of the babies still show a negative Schick test at 6 months, while at from 9 months to 1 year 70 per cent are positive.[2] This is in agreement with the mass of statistics that has been gathered.

Our purpose in this investigation was to determine whether or not passive immunity, as evidenced by a negative Schick test, would interfere with the active production of antitoxin. Preliminary Schick tests were done on all infants and vaccination was carried out in the usual manner employed at this institution.[3] This consists in the administration of two 1 cc. doses of diphtheria toxoid at a one week interval and is the technic followed in the public health program of the Chicago Board of Health. Both negative and positive reactors were vaccinated and follow-up Schick tests then done one month, three months, six months, nine months, one year and eighteen months after the second injection, when possible. In this manner the results of vaccination could be followed in both the infants who had lost their passive immunity (positive reactors) and in those who still retained it (negative reactors).

The results are given in table 1. There are seventy-four cases in this series, forty-four of which were

From the St. Vincent's Infant Hospital and the Department of Pediatrics, University of Illinois College of Medicine.

1. Greengard, Joseph: Immunity Produced by Diphtheria Toxoid, Am. J. Dis. Child. **47**: 799 (April) 1934.
2. Greengard, Joseph: The Schick Test in Infancy, Arch. Pediat. **49**: 526 (Aug.) 1932.
3. Greengard, Joseph: Diphtheria Toxoid (Diphtheria Anatoxin Ramon) in Infancy, J. A. M. A. **97**: 228 (July 25) 1931; footnote 1.

Schick positive before vaccination and thirty Schick negative. In the Schick positive group thirty-nine, or 88 per cent, became negative after vaccination and remained so, while in the Schick negative group twenty, or 66⅔ per cent, turned positive at varying times after the second dose of toxoid. This last figure, it will be noted, is very similar to that obtained in infants who have not been vaccinated; i. e., about 70 per cent Schick positive at from 9 to 12 months. Since the age of the infant is also a factor in the production of immunity, the control group (Schick positives) must be compared with the test cases from this standpoint also (table 2). It will be noted that there are naturally more older infants in the Schick positive group, so that the two are not precisely parallel, though the infants under 6 months are almost identical in distribution. The difference in immunity response is so striking, however, that the factor of age alone cannot be held accountable. This study is continuing with a view to accumulating a larger series over 6 months of age.

TABLE 1.—*Results of Vaccination in Thirty Cases with Negative Preliminary Schick Tests*

Age Vaccinated	Repeat Schick 1 Mo.	3 Mo.	6 Mo.	9 Mo.	12 Mo.	18 Mo.	Total Positive	Total Negative
1-3 months	0	+	+	..	..	..	6	3
	0	+	+	+	..	..		
	0	0	0	..	..	..		
	0	+	+	+	+	+		
	0	0	0	0	..	..		
	0	0	0	..	..	..		
	+	+	0	..	..	..		
	0	+	+	+	..	..		
	+	+	+	+	+	..		
3-6 months	0	0	+	+	+	..	12	5
	0	+	..	..	..	..		
	+	+	+	+	..	..		
	0	0	0	0	0	..		
	0	0	0	0	0	..		
	0	0	0	..	..	..		
	0	0	0	..	..	..		
	0	+	..	..	..	..		
	0	+	+	..	..	..		
	0	0	+	+	..	..		
	0	+	+	+	+	+		
	0	+	+	..	..	..		
	+	0	0	..	..	..		
	+	+	+	..	..	..		
	0	0	0	..	..	..		
	+	+	..	..	..	..		
	+	+	..	..	..	..		
6-9 months	0	+	+	+	..	..	2	1
	0	0	0	0	..	..		
	0	0	+	+	..	..		
9-12 months	0	0	0	..	..	..	..	1
							20	10

COMMENT

Park [4] has stated that immunization with toxin-antitoxin mixtures was inadvisable in the presence of passive immunity and ascribed the failure of the production of antitoxin in such individuals to overneutralization of the mixture. So far as we know there are no clinical reports relating to the effect of passive immunity on vaccination with toxoid. Several reports of animal experiments are significant in this connection. Moloney and Fraser [5] have shown that under certain conditions passive immunity will retard or prevent the establishment of active immunity produced by diphtheria anatoxin in the guinea-pig. They have also shown that there is a difference in the effect of homologous and heterologous serums in this respect, the latter being excreted much more rapidly than the former. Surraco [6] has shown that injection of heterologous antidiphtheria serum rendered vaccination with diphtheria anatoxin ineffective in the guinea-pig. Ramon and Lafaille [7] similarly have shown that mixture of tetanus anatoxin and antitoxin failed to immunize guinea-pigs and rabbits and their injection also interferes with subsequent attempts at specific immunization. These experiments confirm the results in our babies. Here we are dealing with passive immunity with a homologous serum, which consequently is long lasting. When vaccination is carried out at 6 months of age in the ordinary routine manner, without preliminary Schick testing, about half of the infants inoculated will still retain their passive immunity. According to our results, few if any of these will be immunized. Such a situation is of great importance, since it invalidates an immunization program to a great extent. If immunization is to be carried out at 6 months, preliminary Schick tests should be done and only the positive reactors inoculated, the negative reactors being retested and vaccinated as positives appear. If this cannot be done, routine immunization might well be withheld until from 9 to 12 months, when practically all babies will have lost their passive immunity.

TABLE 2.—*Age Distribution Before Vaccination*

	Schick Negative	Schick Positive
From 1-3 months	9	5
From 3-6 months	17	16
From 6-9 months	3	10
From 9-12 months	1	8
Over 1 year	2	5

SUMMARY AND CONCLUSION

Preliminary Schick tests were done on all infants and vaccination with diphtheria toxoid was carried out in both the positive and the negative reactors. The negative reactors, i. e., those who still retained their passive immunity, demonstrated a positive Schick test in two thirds of the cases, the course of their passive immunity corresponding closely to that of infants who have not been vaccinated. The positive reactors, control series, turned negative and remained so in 88 per cent of the cases. We may therefore conclude that passive immunity in infants interferes with the development of antitoxin in response to vaccination with diphtheria toxoid. Such vaccination, therefore, should not be done in young age groups without preliminary Schick testing.

185 North Wabash Avenue.

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The Girl Approaching Puberty.—The cardinal facts to impress on the girls are these: (1) the importance of building up and caring for her body during this formative period of her life, (2) the normality of menstruation and the fact that in itself it should not cause any interference with the girl's life activities. If, in addition, the girl is fortunate in having some one explain to her in simple fashion the significance of such body phenomena as menstruation, or enlighten her as to a few simple facts as to the reproductive phenomena in general, it is all the better for the girl. No one can quite take the place of the mother in instructing her daughter in the simple and beautiful truths of the reproductive life and its various manifestations.—Novak, Emil: The Woman Asks the Doctor, Baltimore, Williams and Wilkins Company, 1935.

ROENTGEN DIAGNOSIS OF TUMORS OF THE BREAST

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Roentgen examination affords a reliable and comparatively easy method of studying the structure, physiology and pathology of the female breast. Neoplasms and other pathologic processes in the mammary glands can be visualized on the roentgenogram; also the changes incidental to menstruation, pregnancy and the menopause. By clinical examination it is often impossible to determine whether or not a mass is present in the breast. Transillumination has thus far not proved dependable as a means of diagnosis. Formerly it was necessary to resort to biopsy or operative removal in cases of suspected or questionable new growth of the mammary gland in order to make a definite diagnosis. The necessity of repeated palpation and diagnostic operation is greatly lessened by roentgen studies.

We have made roentgen examinations of the breast in 320 cases during the past three years and are of the opinion that it is possible to determine the presence of a pathologic process with a high degree of accuracy by this method. Many clinicians do not appreciate the value of the x-rays in studying the mammary glands, and the majority of roentgenologists are not carrying out this examination at present. Any means of increasing the accuracy of diagnosis or facilitating early diagnosis is of value. We are therefore presenting the technical and diagnostic aspects of the subject in considerable detail with the hope that others will be stimulated to carry out similar studies.

HISTORICAL NOTES

Warren [1] in 1930 reported a series of 100 cases of lesions of the breast studied roentgenologically and demonstrated the value of this method for the first time. Seabold discussed the roentgen diagnosis of diseases of the breast [2] and also the technic of the examination.[3] Fray and Warren [4] in 1931 considered the differential points in the study of carcinoma and mastitis. Lockwood [5] in 1932 and subsequently [6] in collaboration with others called attention to the importance of the x-rays in the diagnosis of breast tumors and correlated the symptomatology with the roentgen observations. Vogel [7] discussed the diagnostic and prognostic significance of the x-rays in the study of mammary gland tumors. Reimann and Seabold [8] compared the roentgen observations with the pathology. Ries [9] showed that it is unsafe to inject foreign material, such as iodized poppy-seed oil 40 per cent, into the milk ducts for diagnostic purposes because of the danger of resultant infection. Several other contributions emphasizing the value of the x-rays in the examination of the breast have appeared in the European literature.[10]

ANATOMY

The adult female breast is composed of a number of lobes, subdivided into lobules and separated from one another by connective tissue and elastic septums. Histologically the breast is made up of three prime elements: (1) glandular structures, (2) fibrous tissue and (3) fat. 1. The glandular lobules are composed of rounded alveoli. The lactiferous ducts number from fifteen to twenty, converge centrally toward the alveoli, and unite to form the canals that conduct the milk to the nipple. The ducts and acini are lined with epithelium, which rests on a layer of smooth muscle and is continuous with the epithelium of the body. During pregnancy the gland tissue undergoes hyperplasia and the ducts elongate. At the same time the connective tissue diminishes markedly, so that the lactating breast is made up almost entirely of ducts, acini and blood vessels, with little or no fibrous elements. After the cessation of lactation the acini atrophy but the ducts do not, and as the breast shrinks there is marked convolution and apparent increase in the number of ducts. During each menstrual period similar but less marked changes occur. 2. The fibrous tissue forms septums between the lobes and lies outside the smooth muscle on which the glandular epithelium rests. As previously stated, the breast during pregnancy is made up almost entirely of glandular tissue; after lactation there is a marked hyperplasia of the fibrous elements. 3. The fat lies in the lobes in a loosely constructed fibrous tissue containing elastica. The amount of fatty tissue varies with the size and conformation of the breast.

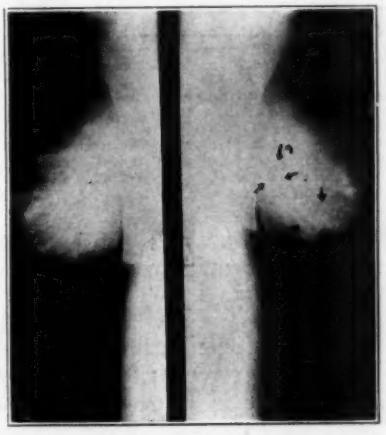

Fig. 1.—Normal breast (multipara, aged 40). The ducts are seen as linear striations in the lower and middle portions of the breast shadow. The acini are indicated by the arrows in the proximal and the middle portion of the breast. The nipple stands out clearly as a rounded area of density.

X-RAY TECHNIC

The x-ray studies require no previous preparation of the patient and cause no pain or discomfort. No special apparatus is required and the examination may be carried out by any competent radiologist. Because of the necessity of obtaining sharp films with the

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maximum amount of diagnostic detail, the technical aspects of the subject will be described carefully.

The patient bares the chest and breasts, lies face up on the x-ray table, and is turned slowly to the side until she is in such a position that the central x-ray beam may pass through the breast to the film without striking the ribs. The upper arm of the side being examined is placed at right angles to the body with the forearm alongside the head, palm upward. The head may be rested on the upturned palm or preferably supported on a small pillow. The entire arm must not be extended under the head, as this tenses the axillary muscles and may obscure glands in the axilla. Pillows or sandbags are placed behind the patient to ensure steadiness. The opposite breast is drawn back and held against the chest wall by the free hand or adhesive tape if necessary. The Bucky diaphragm is used and the films are made stereoscopically. Speed is essential in making the roentgenogram to eliminate motion due to movement, breathing or transmission of the cardiac impulse.

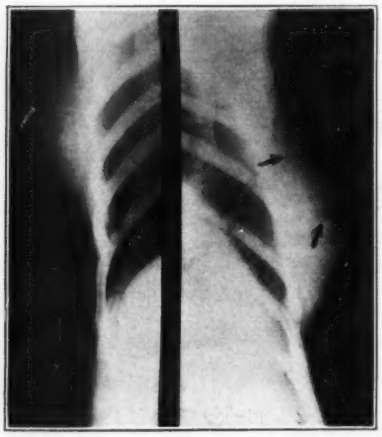

Fig. 2.—Mazoplasia with adenoma (patient, aged 26). The breasts show diffuse haziness with mottling and absence of striations. Arrows indicate the mass in the upper pole of the left breast, which has been present for several months. Roentgen diagnosis, benign tumor, fibro-adenoma; operative confirmation. Pathologic report, benign intracanalicular adenoma.

A soft tissue technic is used as follows: double intensifying screens; from 30 to 60 peak kilovolts; an exposure of from one-half to two seconds: 30 milliamperes; 30-inch target-film distance. Roentgenograms of both breasts are always made for purposes of comparison. It may be necessary to make films of the affected breast at different angles and with varying exposures to bring the suspected area into view. If the breast is large and pendulous, it may be helpful to place a support, such as a small inflated rubber bladder, under it. However, the breast must always be as near the film as possible. The central beam is focused over the middle of the breast and slightly outside the lateral chest wall. The film should include the entire axilla, the ribs for a distance of several centimeters, and a portion of the adjacent lung. The examination is best carried out at the middle of the intermenstrual period. Serial examinations are of great value.

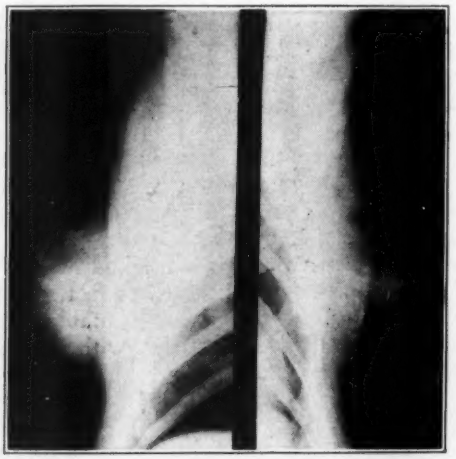

Fig. 3.—Fibro-adenoma (patient, aged 31). A mass had been noted in the left breast for six weeks and had grown slightly larger recently. Arrows indicate an irregular area of density in the midportion of the left breast, with compression of the linear markings in that region. Diagnosis, adenofibroma; operative confirmation.

THE ROENTGEN PICTURE OF THE NORMAL BREAST

The mammary gland lends itself readily to roentgenography by virtue of its anatomic position. With the exposures commonly used for the study of the bones or internal organs, however, the entire breast casts a shadow of almost uniform density. By means of the soft tissue technic, previously described, it is possible to bring out the slight differences in the densities cast by the glandular structures, fibrous elements and the fatty tissues, which comprise the normal breast, and to obtain x-ray films of diagnostic value. The changes incidental to menstruation, pregnancy and the menopause cause alterations in the breast tissues which, though very slight, are demonstrable on the roentgenogram. Pathologic processes are visualized because they cause distortion of the structures or are either more or less dense than the normal tissues of the mammary gland. The film of a normal patient is reproduced in figure 1. The breast appears as a rounded or roughly triangular shadow with the ribs and upper arm faintly shown. The ducts are seen as multiple, sharply defined, irregular, linear striations varying in width from 1 to several millimeters. These striae are somewhat feathery and traverse the breast shadow obliquely to converge toward the surface in the region of the nipple. The acini lie near the chest wall in the middle and lower portions of the breast shadow. They consist of numerous fine, irregular, mottled areas of a density continuous with the shadows of the ducts. The acini and ducts are usually arranged in a roughly triangular form with the base of the triangle near the chest wall and the apex directed toward the anterior and inferior portion of the mammary gland. The main mass of the breast appears as a homogeneous or slightly mottled area of density, varying with the amount of fatty tissue. Mammary glands with large amounts of fat, while difficult to examine properly by palpation, lend themselves readily to roentgen study and produce sharp roentgenograms with good contrast. The flat, poorly developed breast may produce a more homogeneous shadow on the roentgenogram and is therefore more difficult to roentgenograph satisfactorily. Lesions

Fig. 4.—Cystoplasia (cystic mastitis). Thickening of the linear striations with irregularity of outline and wide separation of the striae. Multiple trabeculated areas of radiance of varying size throughout both breasts.

in the outer and middle portions of the breast are usually visualized with ease. Small masses in the inner and upper portion of the breast may be seen only with difficulty.

The skin and subcutaneous structures are shown in profile along the outer edge of the breast and are less dense than the main mass of the mammary gland. The nipple may be visualized as a rounded or oval area of

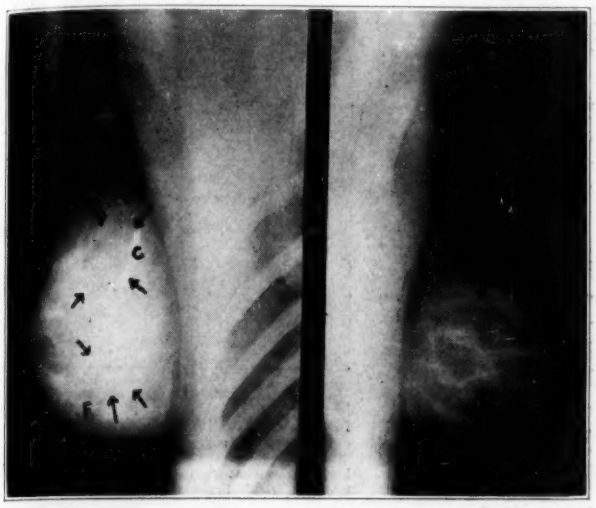

Fig. 5.—Cystoplasia (cystic mastitis) with cysts. The typical changes of cystoplasia (see text) are well shown. Multiple cysts are present, the arrows in the upper portion of the right breast indicating a characteristic cyst. In the lower pole of the breast (*F*) there is an area of fibrosis the result of a breast abscess that was operated on ten years ago.

density, especially if pigmented (fig. 1). Extending along the base of the breast is a thin, linear area of radiance and beneath this appear the pectoral muscle, ribs and lung. The normal axillary lymphatic structures are not demonstrable. Enlarged lymph nodes may cast a shadow. Calcified glands are seen clearly. The axillary hair may be seen as thin, thready shadows.

The breast is not a static organ but is constantly undergoing changes that are associated with menstruation, pregnancy, involution and so on. These physiologic alterations cause constant variations in the roentgen picture of the breast. Beginning about a week or ten days before the onset of the menses, the linear striae become denser and thicker and the entire breast increases in density. When the menstrual flow has begun, the striations become less dense; during the subsequent ten days the breast slowly returns to its previous condition and the normal resting stage reestablishes itself. It is therefore advisable to inquire into the menstrual history; the roentgen examination is best made at about the middle of the intermenstrual period.

In the later months of pregnancy, the breast becomes increasingly dense and the linear striations diminish progressively and finally completely disappear. During lactation the breast is markedly enlarged and presents a uniformly dense shadow. After the menopause the breast may decrease in size. The linear markings show a diminution in number and size but lie more closely together and are usually slightly increased in density.

PATHOLOGIC CONDITIONS OF THE BREAST

Mazoplasia (chronic mastitis).—Formerly, breasts were classified as normal or as showing chronic or cystic mastitis. In the light of recent studies this classification has been found to be unsatisfactory. The state commonly known as chronic mastitis is in reality a physiologic process and not in any sense inflammatory. For this condition Cheatle and Cutler [11] have suggested the name mazoplasia. The cases previously grouped as chronic cystic mastitis are by these authors now classified as "cystiphorous desquamative epithelial hyperplasia." We feel that the classification of Cheatle and Cutler is much more nearly in accord with the physiology and pathology of the breast than the previous terminology and strongly urge its universal adoption.

In cases of mazoplasia there is desquamation of the epithelial cells in the ducts and acini, formation of new ducts and acini, and hyperplasia of the fibrous tissue. The cells that have been shed die and accumulate in the ducts and acini, causing distention, pain and a nodular, irregular feeling when the breast is palpated. These changes may occur in patients of any age but are most frequent in those between 30 and 40, especially in multiparas. Mazoplasia appears to be associated with a disturbance of the hormones, as these patients frequently have a history of short, scanty menses. Cysts are not seen in this type of breast, nor do papillomas or malignant growths develop in these patients. Fibroadenomas do occur, however, and appear to be the only pathologic process that can be traced to mazoplasia. Mazoplasia is not a surgical condition and usually disappears at the menopause, bearing out the opinion of Cheatle and Cutler that it is a physiologic rather than a truly pathologic process.

The roentgen picture of mazoplasia is characteristic. The breasts cast a diffuse, hazy shadow with areas of slightly mottled and increased radiance distributed at irregular intervals. The linear striations of the ducts and acini normally present are entirely absent or nearly so over the main mass of the breast shadow. A few of the linear markings may be visible in the region just below the nipple. There is usually a narrow band of increased radiability along the outer margin of the breast due to fatty tissue deposited in this region. There is no retraction of the nipple, and the skin of the mammary gland is smooth and regular in outline. No glands are present in the axillae.

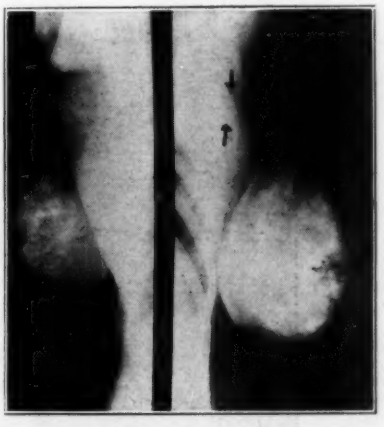

Fig. 6.—Breast abscess (patient, aged 32). Her child had been nursing for fourteen months. Five days before, the left breast became hot, tender and markedly swollen. Operation revealed an extensive abscess of the left breast. Incision and drainage resulted in a cure. Glands in the axilla are indicated by arrows.

Cystoplasia (cystic mastitis; cystiphorous desquamative epithelial hyperplasia). — The condition formerly classified as chronic cystic mastitis is, according to the terminology of Cheatle and Cutler, now termed cystiphorous desquamative epithelial hyperplasia. As a short name for this we suggest the term "cystoplasia" and shall use this term in order to avoid repeating the long and cumbersome name suggested by Cheatle and Cutler. Cystoplasia begins with a desquamation of the epithelial cells of the ducts and acini as in mazoplasia. However, the condition goes on to the formation of

11. Cheatle, G. L., and Cutler, Max: Tumors of the Breast, Philadelphia, J. B. Lippincott Company, 1931.

cysts and thus differs from the physiologic processes of mazoplasia. Cystoplasia is not inflammatory in nature; hence cystic mastitis is not a proper term.

This condition usually begins at about the age of 30. In many patients the process appears to cease in the stage of cyst formation, and the end result is the formation of multiple cysts of varying size scattered throughout the breast. In some instances the changes are progressive, and benign lesions, such as papillomas, form. After about 50, carcinoma may develop in this type of breast. It is as yet uncertain what percentage of cases undergo malignant degeneration, but it is known that cystoplasia is potentially dangerous.

The roentgen picture of cystoplasia is a very typical one. The linear striations formed by the ducts and acini show increased width and density. These striae are more irregular in outline and are separated from one another by a wider space, so that they may appear distributed over practically the entire breast shadow. The striations converge at the apex of the gland and form a broad band extending to the nipple. Scattered irregularly throughout the entire shadow of the mammary gland are multiple trabeculated areas of radiance varying in width from a few millimeters to several centimeters. These areas are sharply defined, have thin linear borders, are more radiant than the normal breast shadow, and represent the cystic formations. The entire breast appears denser and thicker than usual. Contraction and scarring occur frequently and result in distortion of the breast structures on the roentgenogram. The area of radiance at the posterior aspect of the breast is preserved. These changes are usually bilateral and are similar in character on the two sides.

Large cysts result from the obstruction of a duct or acinus, with consequent dilatation proximal to the point of obstruction. Cysts may be single or multiple and appear as smooth, sharply defined, oval or rounded shadows in the region of acini and ducts. If they do not contain fluid, they are more radiant than the remainder of the breast; if filled with fluid, their density is greater. The linear striae may be compressed, but they are not invaded or destroyed by the presence of cysts.

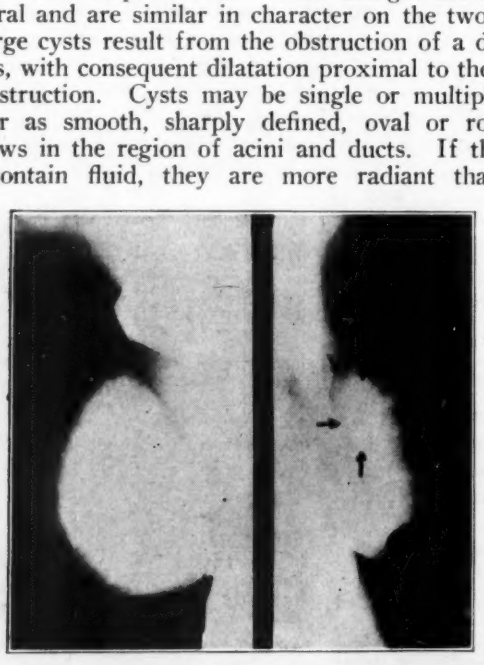

Fig. 7.—Hematoma (unmarried woman, aged 37). Severe trauma to left breast three weeks before. Painless swelling since that time. The mass was hard, movable, nontender and not adherent to the skin. Arrows indicate the hematoma, which was most dense in its central portion and had irregular borders.

Benign Tumors (fibro-adenomas, adenomas, and fibromas).—These tumors occur in breasts which show mazoplasia or are otherwise normal. The neoplasm occurs as a rounded or oval area of density with smooth or slightly irregular borders. The linear markings are absent or diminished over the region of the mass; elsewhere they are compressed and appear crowded together. The lesion is usually single. Masses in the middle and outer portions of the breast are visualized easily; those in the inner and upper portions, especially if the breast is small, may be demonstrated with difficulty, if at all. Calcification may rarely be present within the mass.

Breast Abscess.—This condition usually occurs in the lactating breast. There is diffuse thickening with irregular density at the site of the lesion. The margins of the abscess are not sharply defined as in the case of a neoplasm but fade off gradually into the breast structures. If a very large abscess is present, the breast may be markedly enlarged, with a diffuse, irregular, mottled shadow over its entire extent.

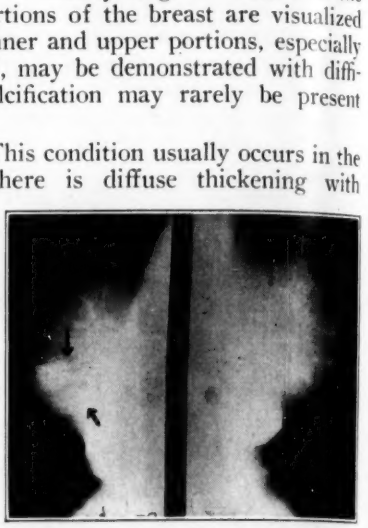

Fig. 8.—Carcinoma (patient, aged 58). A lump in the right breast had been noted for four months. The tumor was dense, sharply outlined and slightly irregular in outline. There was invasion and compression of the linear striae over the lower pole of the right breast. Both breasts showed cystoplasia.

The clinical picture of pain, tenderness, heat and swelling of the breast is well known and usually makes the diagnosis clear. The roentgenogram is of value in demonstrating the size and extent of the lesion and may also be important in the study of the progress of the case. The scars of an old healed abscess may cause irregularities and thickening of the breast structures and may be confused with the earliest stage of a neoplasm. However, serial roentgenograms taken at intervals of a few weeks show no change in the size or character of this type of lesion, and a careful review of the past history elicits the story of an old abscess.

Hematoma and Fibrosis.—A very important, although not a common type of lesion, is the hematoma that forms subsequent to an injury to the breast. This occurs most frequently as the result of an automobile accident in which the driver of the car is thrown against the steering wheel, although it may follow any severe trauma. The history is important in arriving at a definite diagnosis, as the clinical and roentgen pictures may closely simulate those of other lesions. On the roentgenogram an area of density is demonstrable in the breast. This shadow varies in size according to the extent of the lesion, is very irregular in outline, and is most dense in its central portion with less density toward the periphery. The breast markings in the affected area are obscured or distorted. If the lesion is near the surface, there may be bulging of the outer aspect of the breast shadow. Serial roentgen studies at intervals of a few weeks show the area of density becoming progressively denser and diminishing in size. If there is an increase of the size of the shadow and more irregularity of outline with the passage of time, an early malignant condition must be considered. After an interval of several months the mass may become fibrosed, leaving a scar of variable size in the breast. Calcification of the mass may occur, with formation of shadows of the density of bone within the area.

Carcinoma of the Breast.—Carcinoma of the breast may be diagnosed with a high degree of accuracy by

roentgen examination. We do not feel that the earliest stages of malignancy or early malignant changes in a formerly benign tumor of the breast are demonstrable on the x-ray film. However, the method will frequently demonstrate the existence of a neoplasm before it can be diagnosed by other clinical means. In moderately or far advanced stages, roentgen examination shows the character and extent of the lesion and may be of great aid in demonstrating axillary gland or rib involvement.

The malignant growth is seen as a dense, sharply defined shadow on the roentgenogram. The margins of the mass are usually irregular and infiltrating but may in some instances be quite smooth. If small, the tumor causes little if any distortion of breast structures. As the tumor enlarges, the structures are invaded or compressed. The neoplasm may be multiple, with two or more areas of varying size in the breast. Inversion of the nipple or dimpling of the surface of the breast, if present, is demonstrable on the x-ray film. Irregular feathery extension into the surrounding breast tissue from the mass of the tumor is very typical of carcinoma. Lesions near the nipple often show a dense band extending from the neoplasm toward the nipple, the so-called bridge of tumor tissue. In the presence of cystoplasia a carcinoma appears as a dense shadow of much greater density than the remainder of the breast tissue. In cases of extensive, advanced malignancy, multiple rounded irregular masses may replace the greater portion of the breast structure or even occupy the entire mass of the breast.

The tumor may extend posteriorly and invade the clear radiant area normally present between the breast and the chest wall. Extensions to the ribs or metastases to the ribs of the same or the opposite side are demonstrable roentgenologically and are of great importance in diagnosis and prognosis and in deciding on the course of treatment. The study of the remaining breast in patients who have had a breast removed for carcinoma

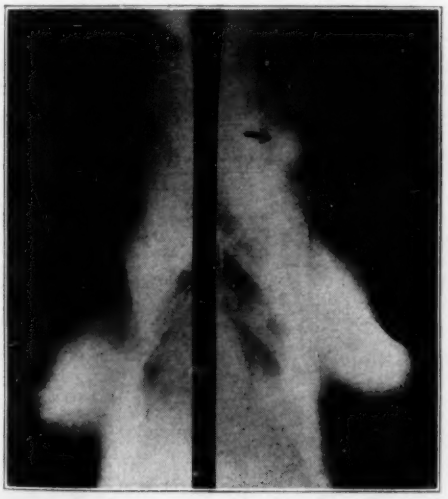

Fig. 9.—Carcinoma (patient, aged 61). The greater portion of the left breast was involved by the malignant growth. A large gland in the left axilla is indicated by the upper arrow. Operative confirmation. The right breast showed involutional changes.

is important. Serial roentgenograms of neoplasms of the breast are of great value in determining the rate of growth and the effect of radiation treatment.

Glands in the axilla are frequently demonstrable, and the breast films should always include the axilla. The glands are seen as oval or rounded areas of density varying from several millimeters to 3 or 4 cm. in diameter. They are smooth and sharply defined and may be more dense at the periphery than in the central portion. Inflammatory glands are usually denser and more sharply circumscribed than malignant glands.

SUMMARY

Roengten examination affords an easy and reliable method of studying the female breast. Neoplasms of the breast and other pathologic processes may be visualized. The changes incidental to menstruation, pregnancy and the menopause are also demonstrable.

The roentgen examination requires no special preparation of the patient and causes no pain or discomfort.

Cheatle and Cutler's classification of mazoplasia and cystiphorous desquamative epithelial hyperplasia is used to replace "chronic mastitis" and "cystic mastitis," these terms being unsatisfactory in the light of recent studies. We suggest the name cystoplasia to denote the condition of cystiphorous desquamative epithelial hyperplasia.

We do not believe at present that the early stages of malignancy or beginning malignant degeneration in formerly benign tumors are demonstrable on the roentgenogram.

Tumor masses can be outlined and the character and extent of the lesion determined. The existence of a neoplasm may be shown by roentgen examination before it can be definitely diagnosed by clinical means.

Glands in the axilla and extension of malignant growth to the ribs are demonstrable on the roentgenogram.

Roentgen studies greatly lessen the need of diagnostic operation and repeated palpation of the breast and give information of value in the diagnosis, prognosis and treatment of lesions of the breast.

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Fig. 10.—Carcinoma with metastases to the axillary glands (patient, aged 56). A mass in the right breast, with palpable glands in the axilla. The lower arrows indicate the malignant growth. There is absence of the linear striae in this region, with compression of the striations in the middle and lower portions of the breast. The axillary glands are indicated by the upper arrows. Operation revealed scirrhous carcinoma of the breast, with axillary metastases.

ABSTRACT OF DISCUSSION

DR. L. A. POMEROY, Cleveland: I wish to discuss this paper not as a roentgenologist but as an observer of a series of patients with tumor of the breast. Of thirty-five patients a few were operated on by me, but most of them were patients of my colleagues and were observed through their courtesy. In every instance, in addition to the regular physical examination, transillumination and roentgen examination of the breasts were performed and the results checked by microscopic examination of tissue removed at operation. Neither transillumination nor roentgen examination provides a definite method of distinguish-

ing benign from malignant tumors, but each method may add additional diagnostic data, sometimes obtainable in no other manner. The greatest usefulness of transillumination is in distinguishing an area of hemorrhage (either into a tumor or into breast tissue) in which the shadow is absolutely black. A cyst containing clear fluid usually does not cast a shadow, but the light may be transmitted through it very brightly. In performing transillumination the Cameron and Cutler lights are excellent, but care should be taken that the eyes are always accustomed to the darkness. Roentgen examination does not make it possible to distinguish benign from malignant tumors, but it may show the presence or absence of encapsulation of the tumor, which is an important factor in making a diagnosis.

Dr. John J. Gilbride, Philadelphia: This subject represents a marked advance in the diagnosis and treatment of disease of the breast. Roentgen examination of the breast by a skilled roentgenologist is of undoubted value in some cases in helping to establish a definite diagnosis. Patients with disease of the breast are visiting their physicians earlier than they did formerly because they have been educated to do so. Now that they are taking that advice, the physician must be able to make an earlier diagnosis. The advanced case is diagnosed readily enough. It is in the doubtful case that one needs all available information. If a young woman complains of pain in the breast and it is not possible to make a clinical diagnosis, the roentgenologist may be able to show shadows on the roentgenogram that suggest the presence of cystic mastitis or other benign disease. This information may enable the physician to assure the patient that the disease is not serious. Patients should be informed to that effect and relieved of their anxiety. Roentgen examination may enable the physician to make a diagnosis of the presence of malignant disease in some cases; in other cases it may suggest that the disease is benign, and in still others it may establish the fact that there is no demonstrable disease of the breast.

PROGRESSIVE ATLANTO-AXIAL DISLOCATION

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Forward displacement of the atlas on the axis is a comparatively rare condition, ordinarily treated by conservative methods. Operative intervention has been recorded in but few cases and only when pressure myelitis has developed. The more common unilateral or rotary dislocation will not be considered here, since it is a less serious lesion, with a far better prognosis, and ordinarily responds to the manipulative method of Walton.[1]

The condition we are considering is frequently immediately fatal. In cases in which death does not occur the diagnosis at first may be easily overlooked, since there is usually no evidence of spinal cord injury. The dislocation is ordinarily a progressive one the seriousness of which is attested only by increasing pressure myelitis or sudden death.

At the time of the original trauma, the common lesion is a fracture of the odontoid process at its base and loosening of the atlanto-axial ligaments with the exception of the strong transverse ligament. The forward displacement at first may be so slight that it is not recognized by x-rays, and the fractured odontoid process may not be apparent without a special technic. It is just at this time that immobilization is so essential to prevent subsequent disaster. After the condition has advanced and is easily recognized, conservative treatment by traction or immobilization may be tried; but in cases in which forward slipping progresses or recurs, operative surgery must be considered whether pressure myelitis has developed or not. Badgley[2] of this clinic has stressed this point.

The first operative attempt to reduce an atlanto-axial dislocation that we have found recorded was by Lewis Stephen Pilcher in 1900:[3]

A man, aged 33, was injured by striking on his head after falling from a ladder. He was able to stand but suffered pain referred to the back of the head and upper part of the neck. The patient had been up and around the house for more than two months when a marked weakness rapidly developed in the right arm and leg. The paralysis increased and the sphincters became involved. "In view of the possibility that the cord symptoms might in part be due to pressure from a depressed fragment of a lamina, it was decided to expose the axis and atlas." A midline incision was made from the external occipital protuberance to the seventh cervical spine. "No fracture of any lamina was uncovered but a forward dislocation of the atlas on the axis was demonstrated to be present. Careful efforts to correct the displacement were futile." Seven months after operation the patient was still hemiplegic, though normal bladder function had returned. He was examined nine years later. Roentgenograms revealed marked forward displacement of the atlas on the axis. There was a dense mass of callus surrounding and obscuring the outline of the atlas and filling the space between the axis and the base of the skull. The patient was able to walk normally for fairly long distances without much fatigue. Abnormal neurologic changes were present, however, in the upper extremities, the right hand presenting to a moderate degree the condition of "main en griffe."

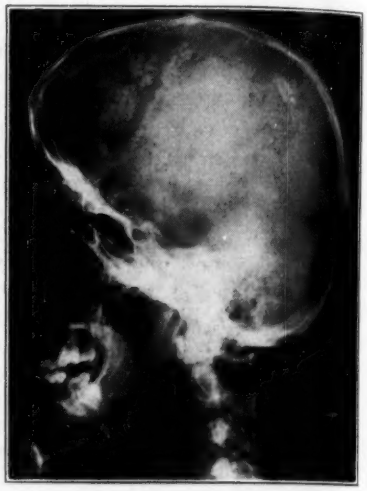

Fig. 1 (case 1).—Appearance on admission, July 15, 1933, three days after injury. The depressed skull fracture is seen in the parietal region. The atlas is tilted slightly forward and there is a fracture of the odontoid process.

The progression of the lesion is well shown in this case and it is surprising that it did not terminate fatally. The operative procedure undoubtedly resulted in the ultimate occipitocervical bony fusion, but whether this prevented further progression is questionable. Had the arch of the atlas been removed at the time of operation, there is no doubt that the neurologic signs would have cleared faster and probably have entirely disappeared.

Mixter and Osgood[4] in 1912 reported two cases of considerable interest:

A boy, aged 15 years, had fallen from a tree five weeks previously. Immediate pain and stiffness of the neck had followed. Roentgenograms revealed no lesion that could be accurately interpreted, but a rotary dislocation of the "atlas or possibly axis" was suspected. Under anesthesia gentle manipulation was carried out, with apparent return to normal. Six months later the patient was again seen because of severe occipital neuralgia. Again roentgenograms failed to reveal the real lesion and a

From the Department of Surgery, University of Michigan Medical School.

1. Walton, G. L.: Reduction of Cervical Dislocation: A Successful Case, Boston M. & S. J. **12**: 553-557, 1893.

2. Badgley, C. E.: Personal communication to the author.

3. Pilcher, L. S.: Atlanto-Axoid Fracture Dislocation, Ann. Surg. **51**: 208-211 (Feb.) 1910.

4. Mixter, S. J., and Osgood, R. B.: Traumatic Lesions of the Atlas and Axis, Ann. Surg. **51**: 193-207 (Feb.) 1910.

second manipulation was carried out. The symptoms were relieved for a month following application of a complete plaster helmet, but following its removal they again recurred. Roentgen studies through the mouth and laterally showed a fracture of the odontoid process with forward slipping of the atlas. At operation, the forward displaced atlas was exposed with the spinous process of the axis. "While forward pressure on the anterior arch was exerted through the pharynx," traction was exerted by a silk band passed around the posterior arch of the atlas. "There was firm resistance to replacement and only a slight amount of reposition was accomplished. This was maintained, however, and the atlas firmly anchored by tying the silk band around the hooked spinous process of the axis." The patient was symptom free two years later.

The second patient had been injured five months before in a railroad accident. Roentgenograms showed forward displacement of the atlas on the axis. No cord symptoms were present. Following manipulation, the patient was well for several months, at which time symptoms of spinal cord pressure came on gradually and developed into a tetraplegia. At operation, the third and fourth cervical laminae were removed. Arches of the atlas and axis were found depressed, pressing into the cord, apparently from callus formation. These pressing protuberances were removed. Improvement in pressure symptoms continued for four weeks, at which time the patient, on sneezing, suddenly became paralyzed and died.

Again the progressive nature of the lesion is seen. It is difficult from the description of the second case to determine whether or not the arch of the atlas and lamina of the axis were completely removed.

Elliott and Sachs [5] report a case in which a man lived for thirty years with an atlanto-axial dislocation. During this time intermittent attacks of paralysis occurred, usually from minor trauma. He was able to be about between attacks. The last attack was fatal. These authors state: "If any operation is to be considered in cases similar to the one under consideration, we suggest a laminectomy—removal of a portion of the posterior arch of the atlas."

Fig. 2 (case 1).—Condition, August 19. No support was worn during this interval.

A case is cited by Craig [6] of a youth, aged 20, who had suffered a football injury eight months previously. He experienced pain below the occiput and limitation of motion of the neck but no paralysis. Roentgenograms revealed anterior displacement of the first cervical vertebra on the second with fracture of the odontoid process. Because there were no symptoms of cord compression at this time, a plaster cast was applied and the patient returned home. Following this there slowly developed increasing weakness of the left arm. Neurologic examination, previously negative, now showed atrophy of both arms with increased reflexes. Roentgenograms revealed no change over the previous examination. Since the symptoms were progressive, operative intervention was deemed advisable. Under local anesthesia, the posterior margin of the foramen magnum and the arch of the atlas were removed. A cast was worn for six months. A report two years following operation revealed that the patient was perfectly well except for slight stiffness of the neck.

5. Elliott, G. R., and Sachs, E.: Observations on Fracture of the Odontoid Process of the Axis with Intermittent Pressure Paralysis, Ann. Surg. **56**: 876-882 (Dec.) 1912.

6. Craig, W. M.: Fracture Dislocation of Cervical Vertebrae with Injury to the Spinal Cord, S. Clin. North America **11**: 841-852 (Aug.) 1931.

The slow onset of cord symptoms is again seen. Roentgenograms were not taken until some months after the injury, so that the exact position at the time of the original trauma is not known. Decompressive laminectomy alone has been very effective here, but there is still a chance that trouble may develop at a later date.

In an article on fracture of the odontoid process, Fritzsche [7] suggests the possibility of bone graft, quoting de Quervain as having had good results in two cases in which a transplant from the spine of the scapula was utilized. This has found its way into the literature under the subject atlanto-axial dislocation. De Quervain's [8] cases, however, were fracture dislocations of the fifth or the sixth cervical vertebra.

Fig. 3 (case 1).—October 10. A Forrester collar has been worn intermittently. Mild symptoms suggesting cord compression are present.

Foerster [9] has reported a case of progressive atlanto-axial dislocation in which three months after the initial trauma a tetraplegia developed with severe respiratory symptoms. The arch of the atlas, lamina of the axis and posterior lip of the foramen magnum were removed. A single fibular transplant 13 cm. in length was placed between the occiput and the spinous process of the seventh cervical vertebra. The symptoms cleared up entirely.

It is possible that this excellent result was obtained from the laminectomy alone, since it is difficult to conceive of much immobilization as coming from the long, narrow transplant itself. The latter was in contact with the cervical spine only at one point, the spinous process of the seventh cervical vertebra.

Juvara and Dimitriu [10] report a case in which a man, aged 29, fell on his head from a tree, and a tetraplegia developed four months later. At operation, the arch of the atlas and posterior rim of the foramen magnum were removed. The spinous process of the axis was split. A tibial graft was placed between the occiput and the split spinous process of the axis and was attached to the spinous process of the third cervical vertebra. Death occurred less than twenty-four hours after the operation. Autopsy revealed an old compression of the upper cervical cord with recent hemorrhage in the gray substance.

In the first case we are reporting, a somewhat similar procedure was carried out:

CASE 1.—E. F., a Polish youth, aged 18, entered the University Hospital, July 15, 1933, three days after having been injured in an automobile accident. A diagnosis, confirmed by x-rays, was made of compound fracture of the left parietal region and multiple fractures of the mandible. Débridement

7. Fritzsche, E.: Ueber die Fracturen des Zahnfortsatzes des Epistropheus: Neue röntgenographische Darstellung des Processus odontoideus, Deutsche Ztschr. f. Chir. **120**: 7-34 (Dec.) 1912.

8. de Quervain, F.: Zur Behandlung veralteter Wirbelluxationen mittelst Osteoplastik, Beitr. z. klin. Chir. **79**: 155-162 (June) 1912.

9. Foerster, O.: Die Leitungsbahnen des Schmerzgefühls, Berlin and Vienna, Urban and Schwarzenburg, 1927, p. 266.

10. Juvara, E., and Dimitriu, V.: Luxation atloido-axoidienne avec phénomènes compressifs: Operation secondaire, Lyon chir. **25**: 668-670 (Nov.-Dec.) 1928.

of the skull fracture was immediately performed. Five days later the mandible [11] was wired. The patient was discharged, August 1, after an uneventful convalescence and was advised to return in a week.

The patient was seen in the outpatient department, August 3, complaining only of pain and stiffness in the neck. These symptoms had been present since the injury but were not seriously considered because of the severity of the other injuries. Examination revealed muscle spasm and limitation of motion of the cervical spine in all directions. The scalp wound was healed. The patient was discharged for another week and returned August 19.

Fig. 4 (case 1).—Film taken after three weeks in traction with a portable x-ray apparatus.

He was now suffering severe pain in the neck and was supporting the chin and occiput in his hands. The head was displaced forward in the typical position of high cervical dislocation. Lateral roentgenograms of the cervical spine showed a forward displacement of the atlas and skull on the axis and a fracture at the base of the odontoid process, the latter having been carried forward with the atlas. In reviewing the original head films, it was seen that there had been overlooked a fracture of the odontoid process with slight forward displacement of the atlas on the axis. The patient was sent home in a Forrester collar.

October 10 the patient returned to the hospital, stating that he had worn the brace only intermittently. The pain had persisted and radiating pain had developed in the right arm. Examination showed marked prominence of the spinous process of the axis. The forward displacement of the head had apparently increased. There was marked weakness of the abductors of the right shoulder. A subjective complaint of numbness in the right upper extremity was not borne out by sensory examination. The deep reflexes of the upper extremities were hyperactive. It was realized and proved by roentgenograms that the dislocation was progressing and that there was undoubtedly pressure on the cord. The patient was placed on a Bradford frame and head traction was applied. The symptoms disappeared almost immediately. A portable x-ray machine, November 30, revealed slight but definite improvement. It was felt that complete reduction by traction was impossible and that closed manipulation would be dangerous. A Forrester collar was again applied and the patient discharged ambulatory, December 15.

Fig. 5 (case 1).—April 3, 1934: Tetraplegia present.

The patient was perfectly well for one and a half months when paralysis of the right side of the body slowly developed, along with incontinence of urine and feces.

He reentered the hospital April 3, 1934, almost completely paralyzed. Neurologic examination revealed no cranial nerve palsies. There was spasticity of all four extremities. The right arm was almost completely paralyzed; the left arm was markedly weakened. The jerks of the biceps and triceps were hyperactive, more so on the right. The abdominal and cremasteric reflexes were absent. The knee and achilles jerks were overactive but equal. There was a bilateral Babinski sign. Analgesia was present from the second dorsal vertebra down but was not demonstrated on the arms. There was diminished vibratory sensation of the right ankle, but sense of motion and position of the toes was normal.

The patient was placed on a Bradford frame with the head in traction, but after five days there was only slight improvement in motion of the arms and legs. Accordingly, operation was performed.

Under tribrom-ethanol-nitrous oxide anesthesia, a midline incision was made from the external occipital protuberance to the spinous process of the sixth cervical vertebra. The muscles were stripped from the occipital bone laterally, starting from the superior nuchal line on both sides, down to the foramen magnum. The spinous processes and laminae of the second, third, fourth and fifth cervical vertebrae were exposed by stripping the muscles subperiosteally. By very careful sharp dissection the muscles over the arch of the atlas were excised. The posterior tubercle of the atlas was seen to be an inch anterior to the spinous process of the axis. The arch of the atlas was removed. Because of the marked angulation of the dura, the foramen magnum was enlarged posteriorly to obtain better decompression. An attempt was now made to reduce the dislocation by manipulation, but without success. Bony shelves were turned down from the occipital bone on both sides of the median nuchal crest. A Hibbs fusion was done from the second to the fifth lamina. A graft obtained from the iliac crest was placed on each side of the midline, starting from the superior nuchal line of the occipital line down to the lamina of the fifth cervical vertebra. Multiple bone chips were placed round the grafts. A small triangular piece of bone obtained from the ilium was placed between the occipital bone and the axis to protect the cord from pressure. Care was taken to see that no bone pressed directly on the exposed dura. The wound was closed in layers.

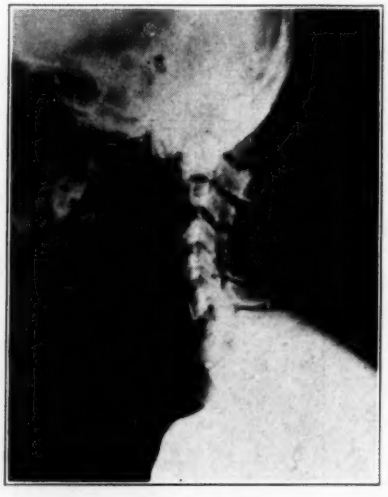

Fig. 6 (case 1).—Oct. 20, 1934, showing bony fusion.

The patient was then immobilized in a plaster cast. The wound healed by primary intention. There was a rapid disappearance of the neurologic symptoms. The patient was allowed up four and a half months after operation. He was soon walking in a Forrester collar. Neurologic examination was now entirely negative except for a bilateral Babinski and Chaddock's sign. The brace was removed seven months after operation after roentgenograms showed evidence of solid bony fusion. Examination at this time showed complete loss of rotation of the head and only a few degrees of flexion and extension of the head on the neck, the motion taking place below the fusion.

The patient returned one year after the operation. He had been working for the past four months as an office messenger. He stated that he felt in no way handicapped by the fusion.

11. Because of this and subsequent partial ankylosis, roentgenograms were never taken through the mouth, and the posterior pharynx was never palpated.

There was from 10 to 15 degrees lateral motion of the cervical spine. There was very slight rotation, the motion taking place just below the fusion. The fusion felt solid clinically.

The only abnormal manifestation on neurologic examination was a suggestive left-sided Babinski reflex. The grip was powerful in both hands.

In atlanto-axial dislocation, one should ever bear in mind the possibility of further progression. The shallow, broad articulating surfaces with the laxness of the ligamentous attachments between these vertebrae predispose to increased forward slipping when the odontoid process has been fractured.

When symptoms of spinal cord compression develop and are not rapidly relieved by traction, removal of the arch of the atlas is imperative. Foerster's patient with marked respiratory difficulty was undoubtedly saved by immediate operation. It is very possible that in the case of Elliott and Sachs the operation, considered at the time but abandoned because of the patient's respiratory disturbance, might have been successful.

Whether removal of the arch of the atlas alone is always sufficient, as in Craig's case, in which there was freedom from cord symptoms after two years, is debatable. In a case cited by Mixter and Osgood this procedure was apparently done, and death occurred suddenly a month later. There is no doubt that solid bony fusion guarantees greater safety.

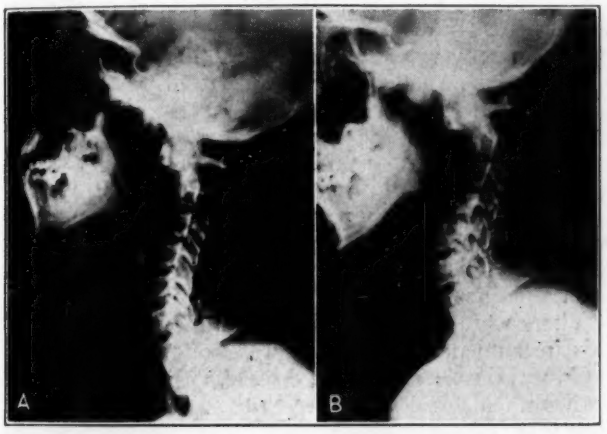

Fig. 7 (case 2).—*A*, Sept. 24, 1934, and *B*, December 20, showing progression under conservative treatment.

In the very acute symptoms of pressure myelitis with respiratory difficulty, removal of the arch alone is indicated. The longer, more traumatizing procedure of bone grafting is out of the question at this time but could easily be done at a later date. With the patient in comparatively good condition, we feel that the more radical procedure should be carried out in one stage.

Several points might be mentioned on technic. As the procedure is an extensive one and dead spaces may be left beneath the grafts, there is some danger of postoperative hemorrhage. When only the arch of the atlas is removed preparatory to placing the graft, the danger is minimized by placing a small graft between the occiput and the axis. This minimizes the dead space beneath the large grafts and prevents direct pressure on the cord.

We have performed two other fusions of the cervical spine after extensive laminectomy. In both of these cases postoperative hemorrhage developed, though it did not manifest itself in either case until the third day. In both cases the wound was reopened. One patient recovered completely and a massive bony fusion developed, while the other case terminated fatally.

We feel that a graft taken from the ilium has several advantages over a tibial graft. The iliac graft is more cancellous, can be split in two, and is more easily molded to the area of fusion.

CASE 2.—D. M., a man, aged 20, admitted to the University Hospital, Sept. 26, 1934, had been injured in an automobile accident one month previously. The only symptoms present were pain and limitation of motion of the neck. The neurologic examination was negative.

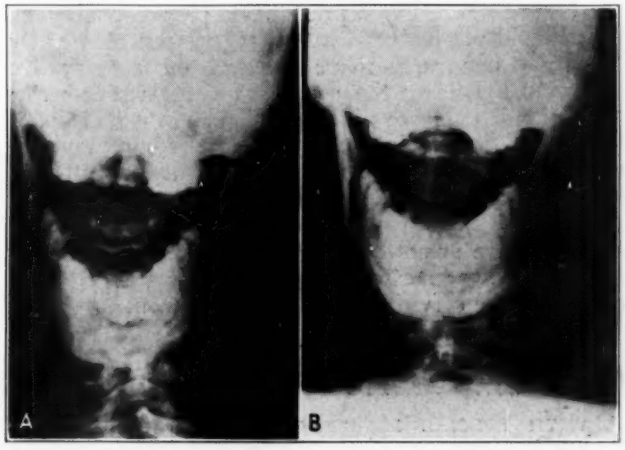

Fig. 8 (case 2).—Anteroposterior views: *A*, Sept. 24, 1934. *B*, December 20, showing progression of dislocation more marked over left lateral mass.

Roentgen examination revealed a fracture dislocation of the atlas on the axis. A Forrester collar was applied, which relieved all pain.

The patient returned for examination, December 20, without complaints. Roentgenograms showed a definite progression of the dislocation but suggested bony fusion. After a week in head traction, improvement was demonstrated by roentgenograms showing that solid bony fusion was not present. The Forrester collar was readjusted and the patient was discharged.

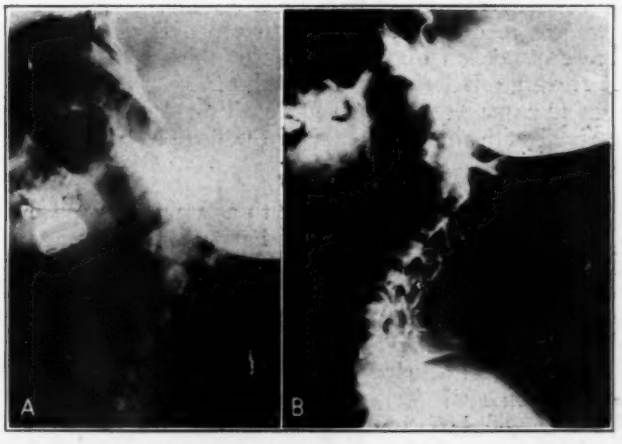

Fig. 9 (case 2).—*A*, Dec. 27, 1934, showing improvement after one week in traction. *B*, April 23, 1935, again showing failure to maintain improvement in Forrester collar.

He was again seen, April 23, 1935, still symptom free. Roentgenograms again revealed increased dislocation. Another trial in traction was suggested to see whether bony fusion in this position was present. This was refused because the patient felt so well, and he was discharged in the collar.

Once more the progressive nature of this lesion is shown. A trial was given conservative treatment with the Forrester collar. In spite of the fact that there was symptomatic relief, giving a false sense of security to

all concerned, the dislocation has slowly progressed, as shown by roentgenograms. The improvement obtained by traction showed that bony fusion had not taken place. Fusion was advised at this time and refused by the patient. The most recent roentgenograms show that conservative treatment has again failed to maintain the correction.

SUMMARY

Forward displacement of the atlas on the axis with fracture of the odontoid process is a progressive lesion. One should not be lulled into a false sense of security following a symptom-free interval on conservative treatment. During the course of conservative treatment, should evidence of progression be found, occipitocervical fusion is indicated before pressure myelitis develops. In retrospection, fusion was indicated in case 1 at a period shown in figure 4, and in case 2 (fig. 9*A*).

If pressure symptoms develop, removal of the arch of the atlas, ordinarily followed by bony fusion of the occiput to the cervical spine, is the treatment of choice.

DIAGNOSTIC GASTROSCOPY

WITH SPECIAL REFERENCE TO THE FLEXIBLE GASTROSCOPE

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My purpose in this paper is to describe the flexible gastroscope, to discuss the technic of examination with this instrument, and to emphasize its simplicity and value.

The diagnosis of internal disease has always been hampered by the impossibility of seeing the involved organs. The advent of cystoscopy marked a great step forward in the diagnosis of pathologic conditions of the urinary tract; proctoscopy made a similar contribution to the diagnosis of diseases of the rectum, and bronchoscopy likewise to diseases of the bronchi. All attempts to devise a simple and practical method for direct inspection of the interior of the stomach, however, were relatively unsuccessful, owing to the difficult anatomic problems involved, until final success was attained with the perfection of the flexible gastroscope in 1932.

HISTORY

In 1868 Kussmaul,[1] the first to attempt gastroscopy, used a rigid open tube, which he introduced into the stomach of a sword swallower. His efforts were not successful, however, because there was no adequate way of lighting the interior of the stomach. This came only after the development of the Edison electric lamp in 1879. The real development of the method began when Mikulicz in 1881 devised a very ingenious gastroscope. He understood all the problems of gastroscopy as they are known today: the visualization through a long tube of the interior of a large cavity, one of difficult topography and requiring distention by air. Mikulicz[2] recognized the fact that a straight line usually cannot be made between the teeth and the lower parts of the stomach and, consequently, devised an instrument with an elbow or knee, which he thought would provide for the necessary angle at the cardia. The instrument was, on the whole, like a cystoscope, a closed tube with a lamp at the end and the objective of the optical system just proximal to the light. There was also an air channel through which air could be blown into the stomach. The instrument was rather large and complicated, perhaps dangerous, and for these reasons Mikulicz apparently gave up his efforts to visualize the interior of the stomach.

Rosenheim[3] in 1895 was the next to make an attempt. He found that a long, straight, rigid tube could be introduced into the stomach in many cases and consequently all gastroscopes from that time on were built as straight, rigid tubes. It is now known that this was unfortunate. It was found that in only about 50 per cent of cases was it really possible to reach the lower part of the stomach. As the years passed, better optical systems were perfected and other improvements were made. In 1908 and 1911 the rather effective instruments of Loening-Stieda and Elsner were developed. Chevalier Jackson[4] tried to eliminate the optical system by working with open esophagoscopic tubes but was only partially successful. A very ingenious development was that of Sussmann[5] in 1911, who constructed a flexible tube, which was mechanically straightened into a rigid instrument after its introduction. It soon disappeared from use, however, because the straightening procedure was very dangerous and the optical system was easily dislocated.

Gastroscopy was practically forgotten from that time until the construction of my first rigid gastroscope in 1922.[6] This instrument corrected some of the minor errors inherent in the former tubes, but its essential principles were the same. Nevertheless, it was the standard instrument for ten years. With it I made over 1,300 gastroscopic examinations and viewed the interior of the stomach in a great variety of diseases. Other examiners reported observations in several thousand additional cases.[7]

There were numerous contraindications to the use of this instrument, such as the presence of a short, thick neck, arteriosclerosis, heart disease, slight kyphosis and scoliosis. Marked resistance to the introduction of the tube was frequently encountered at the cardia. Rupture of the esophagus in overcoming this resistance was quite possible. It was obvious even in the beginning that it would be impossible to employ this instrument in daily clinic use. Further experience verified this early impression and convinced me that this instrument could not be used as a routine procedure.[8] It was, in my experience, however, superior to and safer than the open tube type of gastroscope but, nevertheless, not satisfactory.

Consequently, it became necessary to perfect an instrument which would be flexible from a point about 3 cm. above the cardia to the distal end of the tube.[9] Roentgenologic studies showed that the distal end should be one which could be bent in two different planes. The solution of this difficult optical and mechanical problem became possible only when it was discovered that a tube

1. Kussmaul, A.: Ueber der Magenspiegelung, Ber. d. Naturforsch. Gesellsch. Freiburg **5**: 112, 1868.
2. Mikulicz, J.: Ueber Gastroskopie, Wien. med. Presse, 1881, pp. 1410, 1439, 1473, 1505, 1537, 1573.
3. Rosenheim, T.: Ueber die Besichtigung der Kardia, nebst Bemerkungen über Gastroskopie, Deutsche med. Wchnschr. **21**: 740, 1895.
4. Jackson, Chevalier: Gastroscopy, M. Rec. 1907, p. 549.
5. Sussmann, M.: Ein biegsames Gastroskop, Therap. d. Gegenw. **52**: 433, 1911.
6. Schindler, Rudolf: Die diagnostische Bedeutung der Gastroskopie, München. med. Wchnschr. **69**:535, 1922; Lehrbuch und Atlas der Gastroskopie, Munich, J. F. Lehmanns Verlag, 1923.
7. Rachet, J.: La gastroscopie, Paris, Gaston Doin & Cie, 1926. Gutzeit, K.: Die Gastroskopie im Rahmen der klinischen Magendiagnostik, Ergebn. d. inn. Med. u. Kinderh. **35**: 1, 1929 (extensive bibliography). Olleros, R.: La gastroscopia, Rev. espan. y ann. de laryng., Nov. 1932.
8. Schindler, Rudolf: Ueber die zukünftige Entwicklung der Gastroskopie, München. med. Wchnschr. **75**: 174 (Jan. 27) 1928.
9. Hoffmann, M.: Optische Instrumente mit beweglicher Achse. München. med. Wchnschr. **58**: 2446, 1911.

filled with very thick lenses, with a short focal distance, could be bent in several planes to an angle of about 34 degrees without distortion of the image. Attempts were made to construct tubes that would be flexible at all points. The optical difficulties involved were largely overcome, but it was found that a better control of the objective could be maintained by keeping the proximal half of the tube rigid and maintaining adequate elasticity in the flexible distal half.

THE FLEXIBLE GASTROSCOPE

The perfected flexible gastroscope was first described in 1932[10] (fig. 1). It has the diameter of an Ewald stomach tube. In one model the point is set at an angle and bears a sponge, which cleans the esophagus and

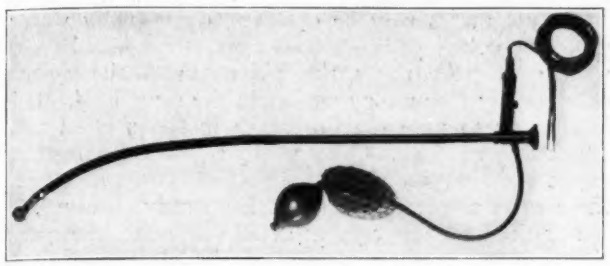

Fig. 1.—The flexible gastroscope.

thus prevents the electric lamp and the objective from becoming soiled during the introduction of the instrument. The standard instrument, however, has a straight point. The optical system is diagramed in figure 2. The distal half of the instrument remains flexible through the entire duration of the examination. Continued experience with it has shown that it can be introduced with little difficulty and without serious discomfort to the patient. It is safe theoretically, and it has been found safe in practice.[11]

TECHNIC OF EXAMINATION

The procedure in the hands of a trained specialist is a rather simple one and may be carried out in the office or clinic. The two chief requirements, in addition to experience on the part of the examiner, are the help of a trained assistant and the cooperation of the patient. After the examination, the patient may return at once to his work, and no prolonged disability results. Repeated examinations have been carried out on many persons, three or four having been made frequently without difficulty, and in one case sixty-five.

The patient should come for the examination with an empty stomach, not having taken anything at all by mouth since the previous day. He then receives a subcutaneous injection of codeine sulphate 0.03 Gm., together with atropine sulphate 0.0005 Gm. Three quarters of an hour later the pharynx and the hypopharynx are anesthetized with a 2 per cent solution of pantocain. This anesthesia is induced by first swabbing the pharynx with a cotton sponge soaked in pantocain and then injecting through a specially devised tube[12] a further quantity of pantocain into the hypopharynx. Following this the stomach is emptied with a simple Ewald tube, using the method of the hanging head (fig. 3).[13] The patient then lies on the table on his left side, his head being supported by the hand of the assistant, who sits in a chair, as shown in figure 4. The instrument is introduced very much like a stomach tube, air is blown into the stomach, and the interior of the stomach becomes visible. The various portions of the stomach to be examined are seen by rotation of the instrument from time to time and by varying the depth to which it is inserted. The problem of orientation is quite difficult for the beginner but is learned with experience. The whole procedure generally requires about one minute, but in many examinations it is prolonged for ten or fifteen minutes without difficulty.

CONTRAINDICATIONS

With a rigid instrument there are numerous contraindications, which must be strictly observed. With a flexible instrument, on the other hand, the contraindications are practically those which exist for the passage of a stomach tube, such as aortic aneurysm, esophageal varices and angina pectoris. Strictures of the esophagus and the cardia are absolute contraindications, but these have usually been excluded by the history. If any question remains, fluoroscopy of the esophagus should be carried out as a preliminary procedure,[14] but its routine use is not necessary. Asymptomatic stricture of the esophagus or stomach of sufficient grade to constitute a contraindication to the introduction of the gastroscope can be detected by the difficulty experienced in passing the Ewald tube.

RESULTS

It is impossible at the present time to predict the extent of the contribution which gastroscopy may make to knowledge of diseases in the stomach. My experience thus far has been instructive. It is not possible to review the observations in detail in this article, as I have carried out about 2,000 examinations, approximately one third of them being with the flexible instrument. The most important developments may be summarized as follows: The sharpness of the picture and the clarity of the view obtained are quite remarkable. Indeed, every small hemorrhage or pigment spot can be seen most distinctly. The normal mucous membrane presents a brilliant picture—glistening, bright, orange red. The incisura angularis does not appear as an incisura but as a very characteristic fold, which I usually call the angle, or angulus. Beneath and beyond it in the background may be seen the antrum of the stomach

Fig. 2.—Diagram of the optical system employed in the flexible gastroscope.

leading to the pylorus with its fascinating activity, visible in at least 80 per cent of cases. The portion of the lesser curvature immediately behind the angle remains hidden from view. If the instrument is rotated and gradually withdrawn, the remainder of the stomach and the fornix come into view. The major portion of the cardiac orifice can usually be seen. Between the antrum and the body of the stomach, in about the region of the angle, there is seen a cordlike structure circumscribing the gastric cavity and apparently partially dividing the body of the stomach from the antrum. I have called this the musculus sphincter antri. This has been described anatomically only once.[15] It seems to be a

10. Schindler, Rudolf: Ein völlig ungefährliches, flexibles Gastroskop, München. med. Wchnschr. **79:** 1268 (Aug. 5) 1932.
11. Henning, N.: Erfahrungen mit dem flexiblen Gastroskop nach Wolf-Schindler, München. med. Wchnschr. **79:** 1269 (Aug. 5) 1932; Die Entzündung des Magens, Leipzig, Johann Ambrosius Barth, 1934. Benedict, E. B.: Examination of the Stomach by Means of a Flexible Gastroscope, New England J. Med. **210:** 669 (March 29) 1934.
12. Schindler, Rudolf: A Special Tube for the Anesthetization of the Hypopharynx, to be published.
13. Schindler, Rudolf: Die Lagerung des Kranken bei der Magenausheberung, München. med. Wchnschr. **78:** 194 (Jan. 30) 1931.
14. Jackson, Chevalier, and Jackson, C. L.: Peroral Gastroscopy, J. A. M. A. **104:** 269 (Jan. 26) 1935.
15. Stieve, H. D.: Sphincter Antri Pylori des menschlichen Magens, Anat. Anz. **51:** 513, 1919.

functional rather than an anatomic division between the body of the stomach and the antrum. The apparently normal gastric mucous membrane often contains some hemorrhages and pigment spots. The significance of these is perhaps not yet entirely clear, and they will be discussed elsewhere.

A benign gastric ulcer is usually seen very well, but there are occasionally cases in which it is demonstrated roentgenologically and in which the gastroscope fails

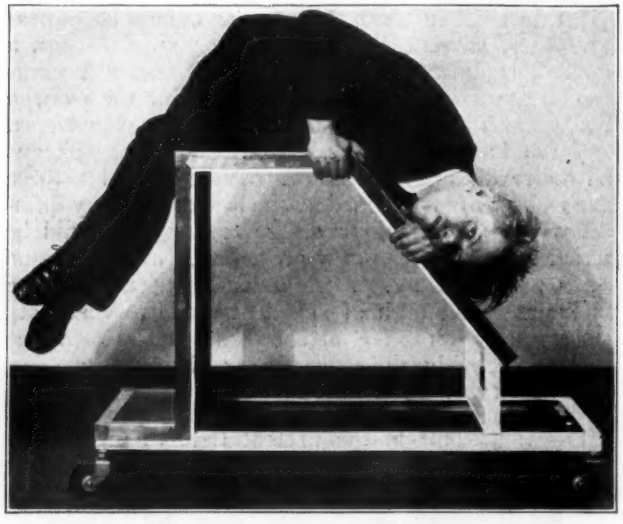

Fig. 3.—Position for emptying the stomach.

to locate it.[16] On the other hand, there are cases in which roentgen examination fails to locate the ulcer but in which gastroscopy shows it quite clearly. The floor of a typical ulcer is yellow or grayish white, its edge is sharp, the lesion is sharply circumscribed and the surrounding mucous membrane may be quite normal, or it may appear swollen, edematous and hyperemic. Folds of mucous membrane converging toward the edge of the ulcer are frequently observed. Such folds are especially common during the healing process. It is interesting to observe the stages through which these lesions pass as a deep penetrating ulcer heals.[17]

Malignant gastric ulcers present a decidedly different picture from that seen in benign ulcers.[18] As a matter of fact, there is much reason for thinking that a differential diagnosis between a benign and a malignant ulcer can be made much more easily by gastroscopy than by any other procedure.[19] The colors, owing to the circulating blood and the reflecting light, are more intense when viewed through the gastroscope than when viewed in the gross specimen. This apparently facilitates the differentiation between benign and malignant ulcers of the stomach. The floor of the carcinomatous ulcer is neither yellow nor brilliant white but rather dark brown or violet. Its edge, instead of being sharp, is ragged and irregular. The transition between ulcerated and nonulcerated tissue is more gradual than in a benign ulcer. The surrounding mucosa appears ridged, infiltrated, and often grayish or white rather than orange red. Occasionally, however, the surrounding tissue is bright red and collar-like and rather abruptly changes into the paler and flatter normal tissue.

A nonulcerating carcinoma, or lymphosarcoma,[20] is usually unmistakable. It appears in multitudinous, ever varying forms, ranging from the flat, diffusely infiltrating types to the massive, polypoid growths. The polypoid mass is easily recognized by its shape. The flat infiltrating tumor is more often characterized by the change in color and apparent texture, a grayish white, rather stiff or ridged area instead of the normal orange red, obviously pliable mucosa as seen in the surrounding portions. Gastroscopy is also of great help in determining the extent of the involvement.

Jejunal ulcers may be observed occasionally with a gastroscope. A gastro-enterostomy stoma can be seen with ease. At times the pylorus and the gastro-enterostomy stoma may appear in the same field. It is interesting to note the difference in the rhythm with which they contract. Occasionally a gastro-enterostomy stoma is found that doesn't seem to contract at all. In these cases a severe gastritis is frequently observed.

For the past thirty years or so there has been great skepticism as to the existence of chronic gastritis, and it had disappeared almost completely from the concepts of gastric pathology. This is indeed strange when it is considered that in all other mucous membranes of the body chronic inflammation is a frequent disease. Gastroscopy, however, has decisively settled the question and has shown that gastritis is of frequent occurrence.[21] Three forms must be distinguished:

1. Superficial gastritis, which apparently involves only the superficial layers of the mucosa and does not produce any interstitial changes. In these cases small red hyperemic areas and occasionally small erosions are seen. Layers of mucous cover large areas of the stomach and heavy strings of mucus lie between the folds.

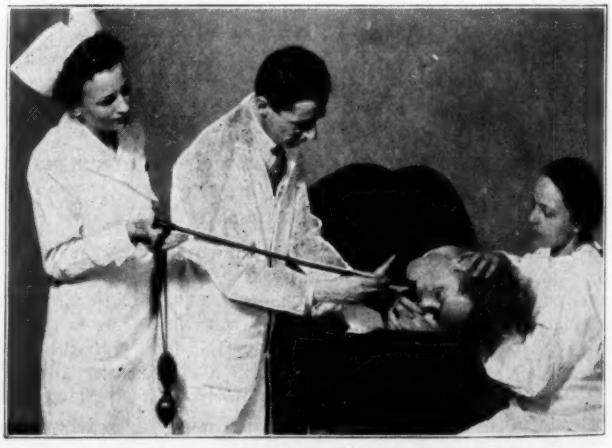

Fig. 4.—Introduction of the flexible gastroscope.

2. Atrophic gastritis. In this condition there may be areas in which the mucosa has apparently atrophied, the normal orange-red appearance being replaced by a gray green in which the course of the blood vessels may be traced. In the normal mucosa the blood vessels

16. Schindler, Rudolf, and Sielmann, H.: Ueber gastroskopische Kontrollen röntgenologischer Reliefbilder der Magenschleimhaut, München. med. Wchnschr. **78:** 1989 (Nov. 20) 1931.

17. Schindler, Rudolf: Gastroscopic Investigations on Healing of Ulcers, München. med. Wchnschr. **70:** 635, 1923; Gastroskopische Untersuchungen über die Heilung des ulcus rotundum ventriculi; das Verschwinden der Haudekschen Nische und seine Bedeutung, ibid. **73:** 1846 (Oct. 29) 1926.

18. Schindler, Rudolf: Gastroscopy in Thirty Cases of Gastric Neoplasm, Arch. Int. Med. **32:** 635 (Oct.) 1923.

19. Schindler, Rudolf: Sur la valeur de l'image-relief radiologique, de la gastroscopie et de la gastrophotographie dans le diagnostic de la gastrite chronique, Semana méd. **2:** 451 (Aug. 7) 1930; Ergebnisse von 76 photographischen Aufnahmen der Magenschleimhaut mit chem. Gastrophotor, München. med. Wchnschr. **78:** 1776 (Oct. 16) 1931; Die Photographie der Magenschleimhaut, ibid. **79:** 1560 (Sept. 23) 1932.

20. Schindler, Rudolf: Gastroscopy in Diffuse Gastric Lymphosarcoma, Klin. Wchnschr. **1:** 2086 (Oct. 14) 1922; Die Bedeutung der Gastroskopie, Monatschr. f. Krebsbekämpf, 1923, p. 203.

21. Schindler, Rudolf: Clinical Diagnosis of Chronic Gastritis, München. med. Wchnschr. **73:** 482 (March 19) 1926. Moutier, F.: Essai de classification des gastrites d'après leur étude gastroscopique, Arch. d. mal. de l'app. digestif. **23:** 527 (May) 1933.

are not discernible. At times a complete atrophy may be seen. The exact relationship between atrophic gastritis, carcinoma, benign tumor, pernicious anemia and achylia gastrica remains to be ascertained.

3. Hypertrophic gastritis. In this condition the mucous membrane is velvet-like and swollen and contains a number of nodules or wartlike excrescences, with numerous creases between the elevations. Frequently, very small and superficial ulcers are present. The exact relationship of this condition to chronic gastric and duodenal ulcer remains to be ascertained.

SUMMARY

1. The flexible gastroscope has made it possible to visualize the interior of the stomach with safety and with relatively little discomfort to the patient.

2. The flexible gastroscope affords an additional method for the direct morphologic diagnosis of gastric disease.

3. Gastroscopy not only supplements the roentgen examination in the direct diagnosis of gastric ulcer and gastric neoplasm, but it aids greatly in their differential diagnosis. It also furnishes direct evidence of the progress of the benign lesions and of the degree of involvement in cases of neoplasm.

4. Gastroscopy reveals gastritis and other changes in the gastric mucous membrane not discernible by other procedures.

Clinical Notes, Suggestions and New Instruments

PRIMARY CARCINOMA OF LIVER WITH HEPATOSPLENOGRAPHY

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The case we are about to present should be of interest to the medical profession for four reasons: (1) the rarity of the condition, (2) the atypical clinical changes, (3) the interesting hepatography and (4) the necropsy.

Primary carcinoma of the liver is a rare entity both clinically and at autopsy. The lesion is present in approximately one out of 2,000 necropsies. Furthermore, primary carcinoma is usually found to inhabit the right lobe of the liver. The following report deals with a primary carcinoma of the left lobe of the liver:

REPORT OF CASE

History.—H. M., a white man, aged 70, a laborer, single, admitted to the hospital in April 1934, complained of generalized abdominal pain, anorexia, weakness, loss of weight and the presence of a "lump" in the left epigastric region. The onset began one year before observation with abdominal pain and fulness after the intake of food, as well as intermittent pains in the flanks and epigastrium, loss of weight, general weakness and, at the time of admission, a feeling of weight in the abdomen. There was a loss of 60 pounds (27 Kg.) from the onset to the time of admission. The only past history of significance was that the patient had been a heavy indulger of alcoholic beverages.

On admission the patient was chronically ill but able to walk around and sit up in a chair. The salient observations in the examination were the pinched features, dulness at the left posterior base of the chest with diminished breath sounds, and the abdominal changes to be described. The abdomen was full in the lower epigastric and upper umbilical zones. The overlying skin and umbilicus were freely movable. A mass was palpated between the epigastrium and the umbilicus, slightly movable and located more to the left of the median line. The right liver edge was just palpable, and mobility with respiration was questionable at this time. There was dulness and tenderness directly over the mass.

From Central Neurological Hospital, Department of Hospitals.

Course.—For four months the complaints remained about constant, except that the patient suffered more from intermittent abdominal pains in the upper half, and a dragging sensation was felt. During this time he did not have constipation in any degree. At this time examination revealed a more distended abdomen centrally and laterally, a distention of the superficial abdominal veins and a tenseness over the mass. The mass felt more superficial and smooth and measured 8 by 15 cm. vertically and transversely respectively, two thirds being to the left of the median line. The tumor, now shaped like an eggplant, had definite upper, lower and lateral borders, the upper edge being 3 fingerbreadths below the inner right costal margin, with a tympanitic note between the costal margin and the upper border of the tumor. The mass was ballotable mainly to the right and upward, not without considerable pain. Dulness and tenderness were still present over the mass. At this time there were crepitus and fluctuation, but no hydatid thrill was present. The right lobe edge was 3 cm. below the costal margin. The mass did not move with respiration, and abdominal respiratory excursions became lessened in depth. A suggestive icteric tinge appeared over the face, conjunctivae and abdomen. In between pains the patient walked about, played a game of cards and conversed, until a bilateral bronchitis developed nine days prior to his death. The patient was afebrile and clear of bronchitic signs three days prior to death. He died in September. Constitutional signs during the clinical course prior to the onset of bronchitis were periods of tachycardia, an occasional degree rise in temperature for one or two days and respirations averaging 22 per minute. The blood pressure on admission was 160 systolic, 80 diastolic, and near death 122/64.

Fig. 1.—Barium meal in colon: pressure effect on colon by large liver.

Laboratory examination revealed the following: The Wassermann test was negative. The blood chemistry was negative on several occasions. The icteric index was normal until near death, at which time it was 15. Galactose cholesterol ester tests were of no aid.

A blood count, April 2, showed: red blood cells 4,200,000, white blood cells 12,600, polymorphonuclear leukocytes 93; hemoglobin 80 per cent; April 18: red blood cells 4,700,000, white blood cells 13,300, hemoglobin 50 per cent; September 2: red blood cells 3,640,000, white blood cells 5,200, polymorphonuclear leukocytes 66, large lymphocytes 34, hemoglobin 85 per cent.

The specific gravity of the urine ranged from 1.010 to 1.016 but otherwise the urine was normal. Examination of the feces was negative for color, ova, increased fat or undigested fiber, pus, blood and the like.

Roentgenograms of the chest showed thickened pleura over the left base. A flat plate of the abdomen showed a soft tissue shadow in the epigastrium, nature unknown, and two right abdominal calcified lymph nodes. The gastro-intestinal tract revealed no intrinsic lesion. There was a narrowing of the distal part of the transverse colon suggesting a pressure deformity of an extrinsic nature (fig. 1).

Fig. 2.—Postero-anterior view after injection of thorium dioxide: large liver and spleen with rarefaction in the area of the left lobe.

Hepatosplenography (75 cc. of thorium dioxide sol in seven days, with no untoward reactions) revealed marked enlargement of the left lobe of the liver upward and downward, the lower border extending to the first lumbar intervertebral disk, and slight enlargement of the right lobe. In the upper third of the left lobe were areas of lessened density. In the lower

Fig. 3.—Lateral view after injection of thorium dioxide sol: liver and spleen superimposed but distinguishable separately.

two thirds was a well delineated semicircular mass of lessened density. An area of lessened density was found in the right lobe. The spleen was moderately enlarged. There was an incidental visualization of gallstones, of which there was no history and of which he never complained (figs. 2 and 3).

The clinical diagnoses, in order, were: metastatic cancer of the liver from a primary gastro-intestinal lesion; primary cancer of the liver; cystic carcinomatous mass of the pancreas, and carcinomatous cyst of the mesentery.

The pathologic diagnosis (by Dr. Vera B. Dalgopol) was primary carcinoma of the left lobe of the liver with a necrotic and hemorrhagic mass protruding over the plane of the liver and its intrahepatic branches; carcinomatous thrombosis of the portal vein, and cholelithiasis (fig. 4).

COMMENT

The foregoing facts of this case may indicate why the tentative clinical diagnoses were made. Here is a case of proved primary carcinoma of the left lobe of the liver, a clinical impression of such being little grounded without the aid of hepatography by thorium dioxide sol. The facts that made a liver diagnosis not too strong were the presence of a well outlined mass with tympany between the upper border and the costal margin, the free mobility, the crepitus and fluctuation and the absence of respiratory mobility. However, the unusual necropsy changes, especially of a necrotic and hemorrhagic carcinomatous mass, pouchlike with well defined borders, fairly well explain the atypical clinical observations. Then again it is surprising that, with such marked thrombosis of the portal vein by carcinomatous liver tissue, there was no ascites but marked compensatory superficial abdominal veins. One will have to be satisfied to assume that the thrombosis of the portal vein was so slow that the venous network was able to compensate gradually for this flow. Yet the age, weakness, loss

Fig. 4.—Postero-anterior view after injection of thorium dioxide sol: Gross specimen liver density changes are more prominent.

of appetite, loss of weight and strength and presence of an abdominal mass were classic in pointing to a carcinomatous process.

Thorium dioxide sol was given as the last means of help in a confirmatory or negative way. The films presented reveal a primary lesion of the liver, which together with the known clinical facts add up to a diagnosis of primary liver carcinoma. Without thorium impregnation, similar cases give a history of needless surgery for exploration. Of course, partial hepatectomy is occasionally attempted. However, even though rarely there is a successful removal of the diseased part, the practice is seldom done owing to the difficulty and dangers of hemorrhage and secondly to the well known sequence of recurrence.

CONCLUSIONS

1. We have presented a case of primary carcinoma of the left lobe of the liver with its atypical clinical observations correlated to and elucidated by the roentgen and necropsy studies.

2. Without the use of thorium dioxide sol there was not enough clinically to strengthen too strong a clinical impression.

3. Thorium dioxide sol, while still debated, has its use in selected cases as a last resort in the diagnosis of liver involvement in abdominal carcinoma; it will aid in determining the operability of the case.

4. This patient would probably not have survived as long as he did had surgical measures for exploratory laparotomy been performed.

5. It is also shown that a complete thrombosis of the portal vein does at times produce no ascites when the process is slow enough to allow gradual venous compensation.

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MACULAR LEPROSY

REPORT OF A CASE OCCURRING WITHOUT ANESTHESIA

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LITTLE ROCK, ARK.

In view of its close resemblance to some of the commoner skin diseases treated by the general practitioner, this case of leprosy is reported. It is of general interest because the severe symptoms and usual signs are absent. The confusion with other diseases, the failure of treatment based on this confusion and the method of arriving at a correct diagnosis add further to the general interest of the case. Although the symptoms had been present a year or longer, the diagnosis was made relatively early. The absence of anesthesia, nodules and alopecia and the presence of a symmetrical, generalized eruption caused various observers to confuse the condition with syphilis, pityriasis rosea and dermatophytosis. A generalized lymphadenopathy constituted a final diverting element in the clinical picture.

McCarthy[1] classifies leprosy as follows: maculo-anesthetic, nodular and transitional types. The maculo-anesthetic type usually shows areas of hyperesthesia and signs of neuritis early in the disease. According to Sutton[2] the great auricular, the ulnar and the peroneal nerves are the first to be involved. The earliest objective cutaneous manifestations suggest a toxic erythema. Apart from a few scattered bullae, which may appear from time to time, the eruption consists of numerous reddish or purplish patches limited for the most part to the face and the extremities. The subsequent evolution of the lesions varies considerably. Some of the patches may fade, leaving brownish pigmentations, while others may become transformed into plaques and nodules.

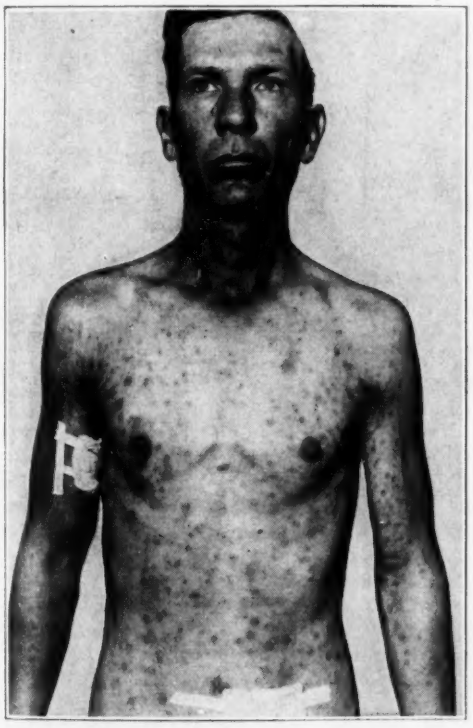

Fig. 1.—Macular leprosy.

The lymph nodes are seldom involved primarily, some authors even alleging that the lymphadenopathy is the result of secondary (staphylococcic) infection.

Alopecia is caused by the general toxemia, although the eyebrows may be damaged by the local granulomatous process. The general toxemia, which marks the stage of invasion, is responsible for the symptoms of fever, headache, joint pains, sweating, weakness and general malaise. Occasionally there is epistaxis.

The mixed type is characterized by macules and nodules. Some of the nodules develop from macules, while others develop independently. The nodules usually contain enormous numbers of bacilli. It has been claimed, however, that in the older lesions the bacilli become rare and correspondingly difficult to find. For this reason the differentiation from tuberculosis and syphilis may be complicated.

Fig. 2.—Lepra cells infiltrating a lymph node.

The appearance of macules is usually preceded by anomalies of sensation, such as formication, burning, stinging or itching.[3] The size of the lesions varies from that of a 50 cent piece (30 mm.) to that of the palm of the hand or even larger. By peripheral extension and coalescence, large irregular areas having curved contours are produced. The centers of the macules usually become depigmented and anesthetic. The borders on the contrary may be hyperpigmented and hyperesthetic.

REPORT OF CASE

A white man, aged 35, a native American, entered the clinic of the United States Public Health Service at Hot Springs, Ark., later being referred to one of us by Dr. O. C. Wenger for consultation. The patient presented a generalized itching eruption, which had appeared one year previously. For three months there had been numbness in the hands, indigestion, loss of appetite and loss of about 15 pounds (6.8 Kg.) in weight. For this condition he had received antisyphilitic treatment. Questioned concerning his past history, he stated that while in an army camp at San Antonio, Texas, in 1918 he had had an eruption which he believed resembled the present one. The personal and family histories were otherwise essentially negative.

The physical examination revealed a generalized, macular, varnish brown to reddish brown eruption, most marked on the anterior surface of the trunk and on the flexor surfaces of the arms. No lesions were noted on the penis, the palms of the hands or the soles of the feet or in the mouth, nose or throat. The macules were round or oval and varied in size from 0.3 to 1.5 cm. They were moderately smooth and nonindurated.

From the Departments of Dermatology and Pathology, University of Arkansas School of Medicine.

1. McCarthy, Lee: Histopathology of Skin Diseases, St. Louis, C. V. Mosby Company, 1931.
2. Sutton, R. L.: Diseases of the Skin, St. Louis, C. V. Mosby Company, 1928.
3. Ormsby, O. S.: A Practical Treatise on Diseases of the Skin for the Use of Students and Practitioners, ed. 4, Philadelphia, Lea & Febiger, 1934.

Although the lesions gave the impression of being elevated, this could not be confirmed by palpation. The symmetrical distribution and the tendency to follow the tension lines of the skin indicated a systemic origin. There was neither scarring nor pigmentation from past lesions. The lymph nodes, particularly those of the inguinal group, were enlarged, reaching a maximum diameter of 3 cm. They were firm but neither tender nor painful. There was slight thinning of the skin on the dorsal surfaces of the hands, which the patient had first noticed several months previously. The physical examination was otherwise negative.

Fig. 3.—Lepra cells infiltrating the corium.

Fig. 4.—A nodule in the subcutaneous tissue.

The laboratory reports were as follows: erythrocytes 4,000,000, hemoglobin 80 per cent, leukocytes 9,400, neutrophils 53 per cent, stab cells 4 per cent, juveniles 1 per cent, lymphocytes 38 per cent, eosinophils 4 per cent. The Wassermann, Kahn and Kolmer tests of the blood were negative. The urine was normal. Smears from the nose showed acid-fast bacilli varying from curved rods about the size of a tubercle bacillus to short rods, which were almost coccoid.

The report on a biopsy of specimens from the cutaneous lesion and a lymph node was as follows: The structure of the lymph node was profoundly altered by an extensive infiltration of large polyhedral cells having an abundant clear cytoplasm and small vesicular nuclei. The cytoplasm of most of the cells was finely vacuolated, but in some a single large vacuole displaced the nucleus to one side. In places germinal follicles remained and these contained many cells which were undergoing mitotic division (fig. 2).

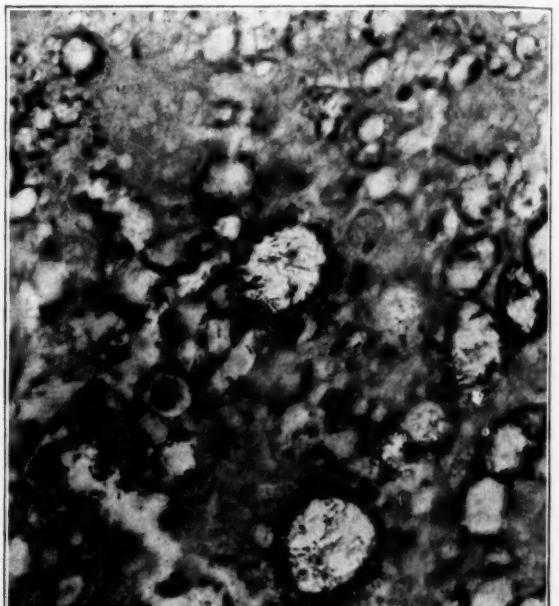

Fig. 5.—Intracellular and extracellular lepra bacilli in a lymph node.

The skin (figs. 3 and 4) showed thinning of the malpighian layer with partial effacement of the papillae. Immediately beneath that layer were numerous compact collections of polyhedral and spindle cells which resembled in all respects the large vacuolated cells found in the lymph node. They occurred chiefly about the blood vessels, where they often formed perivascular sleeves which could be followed for some distance. A few discrete collections were located deep in the corium.

Sections (both skin and lymph node) stained by the Ziehl-Neelsen technic revealed acid-fast rods, which varied greatly in size and thickness. Many of them were arranged in packets (fig. 5). Some were beaded, others solid. Most of these bacilli occurred in the large clear cells previously described.

SUMMARY AND CONCLUSIONS

1. An atypical case of macular leprosy was observed which closely resembled syphilis, pityriasis rosea and dermatophytosis.

2. Sporadic cases of leprosy may occur in native Americans without known exposure to the disease. Because of this fact

the variations in the early manifestations of leprosy should always receive consideration in the differential diagnosis of obscure cutaneous diseases.

3. Macular leprosy may exist for at least one year without clearing in the center of the lesions, formation of nodules or much extension.

4. In the early cases the diagnosis can be made with certainty only by means of a biopsy with demonstration of the organism.

Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

THERAPEUTIC APPLICATIONS OF INSULIN

ELLIOTT P. JOSLIN, M.D.
WITH THE COLLABORATION OF
HOWARD F. ROOT, M.D.
PRISCILLA WHITE, M.D.
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NOTE.—*This article and the articles in the previous issues of* THE JOURNAL *are part of a series published under the auspices of the Council on Pharmacy and Chemistry. Other articles will appear in succeeding issues. When completed, the series will be published in book form.*—ED.

Every one requires insulin, and if a person cannot manufacture what he needs in his own pancreas he is fortunate if he can secure it by purchase or gift. No one, the normal person or the diabetic patient, knows the quantity required to maintain health and strength. Fortunate it is that nature regulates the supply with surprising accuracy, balancing its production with the carbohydrate consumed, whether this is for prompt utilization or for storage, and adjusting its output to the momentary demands of exercise or rest. This normal regulatory mechanism rarely may go awry and too much insulin may be produced; in fact, so much may be secreted that at times death results from hypoglycemia. Probably at other times every one experiences symptoms from an increased production of lesser degree, which he recognizes in himself by hunger and fatigue and which his friends suspect by his altered disposition. But it is difficult to decide whether these states are actually due to too much insulin or to deficient carbohydrate through lack of body glycogen.

Insulin is susceptible to many influences. If the supply of insulin is sufficiently curtailed or possibly if its efficiency is impaired by overaction of pituitary, thyroid or adrenals, diabetes mellitus results. Lowering of the alkalinity of the blood, infections, starvation, or an excessively high fat diet also affects its action adversely, but not strikingly enough to prove that any of these bring on diabetes. The development of diabetes in the obese focuses attention on the possible effect on insulin production of the constant stimulation of the insulin-producing function of the pancreas in order to assimilate the carbohydrate consumed; but it seems hardly likely that the pancreas would be injured in this way, because there is no analogy to this in the field of other ductless glands. Although it is true that a diet high in fat and low in carbohydrate decreases insulin production, as shown repeatedly by many investigators, nevertheless such a diet, when carried out in the Du Bois laboratory for over a year on two human beings, temporarily lowered carbohydrate tolerance, but did not do so permanently. It is remarkable that, whatever agency injures the pancreas, it practically never wholly destroys the ability of the gland to make insulin. Clinical experience confirms physiologic experiments on this point; diabetes is not complete. Obviously this complicates enormously the problem of the therapeutics of insulin, because one never knows how much insulin the active pancreatic remnant yields and therefore how much must be supplied. Just as in health there is reasonable certainty that the production varies under different conditions, so too one can infer that it varies in diabetes. Therefore in the administration of insulin it must always be recognized that one is dealing with a variable, and results must be interpreted cautiously and with extreme deliberation.

The variable course of diabetes makes difficult the interpretation of the action of insulin. This variability in the course of diabetes was emphasized by Naunyn. Of course, he did not actually say that the secretion of insulin was increased or decreased, but he described most clearly the improvement in the condition of the patient who carefully followed dietetic treatment and the reverse in those who neglected it. Today still more clearly is one convinced that, if the diet is extreme in any direction, ultimately the pancreatic function deteriorates. Insulin increases greatly the chance of the diabetic patient to improve, and one sees in increasing numbers patients whose nutritional state has advanced so much with diet, exercise and insulin that diet and exercise alone suffice. Paradoxical as it sounds, the statement is true that the use of insulin enables many a diabetic patient to do without it. Probably no physician appreciates how high this percentage can rise. John in his manual has taken the pains to record a long list of patients who have given it up, and his experience can be duplicated by many others.

Miss P., who had had diabetes for twelve years, with onset at the age of 50, and was bedridden with rheumatoid arthritis, took daily for years a diet of 1,600 calories containing approximately 180 Gm. of carbohydrate, with 80 units of insulin to maintain her weight and aglycosuria. She died of endocarditis and pericarditis. The pancreas, which weighed 15 Gm., was the smallest encountered by Shields Warren in 367 autopsies on diabetic adults. How many units of insulin Miss P.'s pancreas produced daily it is useless to conjecture, but presumably not many.

Miss M., on Aug. 7, 1922, was the first patient to whom I gave insulin. This I considered to be my most severe case of diabetes. The patient's tolerance was estimated as about 7 Gm. of carbohydrate. The patient, now 54, has had diabetes for 17.4 years; she has gained to 137 pounds (62 Kg.) from her erstwhile 69 pounds (31 Kg.), leads an active, useful life, takes 130 Gm. of carbohydrate, 1,688 calories, and is nearly aglycosuric with 44 units of insulin a day. If Miss P., like Miss M., had been able to have the advantage of exercise, very likely her insulin need would have been halved. These two cases suggest that an adult requires between 80 and 45 units of insulin daily; von Holm's experiments would substantiate this opinion. When, therefore, patients say that they require more than 80 or even 50 units, I suspect a complication such as an infection, acidosis, glandular disease, hemochromatosis, or just

plain ignorance or carelessness in the quantity and quality of the diet. This went to such extremes in the daily life of one patient that actually less or at least no more insulin than she was accustomed to take daily on her own account was sufficient to bring her out of diabetic coma while under hospital supervision.

EFFICIENCY IN THE USE OF INSULIN

To attain maximum efficiency in the use of insulin, its continuous administration would be necessary. Only thus would one imitate nature, which regulates the insulin supply according to the carbohydrate demand of the hour, nay, even of the minute. The Toronto workers early pointed out the advantages of the multiple over the single dose. The more frequently insulin is given, the less is required to produce the same result. Von Holm showed this beautifully with depancreatized dogs. With a constant intravenous injection of insulin, Bertram calculates from von Holm's experiments that a normal adult of 60 Kg. requires 7.8 units per day when fasting and 48 units when living on a diet the caloric value of which is composed exclusively of carbohydrate.

One dose of insulin a day will suffice for many a diabetic patient, perhaps for half of those who require

TABLE 1.—*The Dietetic Treatment of Seven Groups of Thirty Cases Each of Diabetes* *

Group	Date	Age at Onset, Years	Carbohydrate, Gm.	Protein, Gm.	Fat, Gm.	Calories per Kg.	Insulin, Units	Weight, Kg.
I	1915	40	26	54	76	18	..	57
II	1916	46	43	60	82	21	..	56
III	1917	42	43	60	90	23	..	54
IV	1923	37	71	58	123	34	13	53
V	1927	46	96	60	113	28	21	59
VI	1931	43	144	68	90	29	21	58
VII	1933	40	153	73	91	29	26	60

* Joslin, E. P.: A Diabetic Manual, ed. 5, Philadelphia, Lea & Febiger, 1934, p. 60, table 5.

it, but the severer the disease, the more frequent should be its administration. Ordinarily a dose of insulin exerts an action for eight hours. In infections one resorts to injections of insulin every six, four, three or two hours, and in coma, in which the need is extreme and the demand for efficiency in action the greatest, it is often injected every thirty minutes.

When one dose of insulin per day suffices, it is usually best to give that before breakfast; if two doses are necessary, doses are given before breakfast and supper. If these doses reach the level of from 20 to 40 units each and are still inadequate to control glycosuria, then three or four doses a day may be advisable. Often, particularly with young persons who have severe diabetes, it will be found helpful to give the third dose at bedtime; i. e., from 10 p. m. to midnight. By so doing one decreases the tendency for the blood sugar to rise in the early morning hours, and an adequate dose at bedtime may enable a patient with severe diabetes to awake with a sugar-free urine. The late evening dose is usually given without food and must be relatively small, 2, 4 or 6 units, in order not to provoke hypoglycemia. Some patients require a dose of insulin before each of the three meals plus the bedtime dose. We have not thought it advisable to give insulin "by the clock," i. e., every six, eight or twelve hours, regardless of meals, because of the danger of producing hypoglycemia. Some clinicians do advise and use such a method, however.

THE ACTION OF INSULIN

Insulin lowers the percentage of sugar in the blood and favors its storage and utilization in the liver, muscles and skin in the form of glycogen. As a result, calories are conserved, not lost, and acidosis is prevented, and thus the processes of metabolism function normally. Occasionally the action of insulin is so great that the blood sugar is lowered below the normal level and a whole train of phenomena arise, dependent in part on the low blood sugar per se, the lessened glycogen in the tissues or the excess of protective counter-regulatory processes set in motion to raise the blood sugar. The combination of all these processes is known as an insulin reaction, or insulin shock. The harmful effects of a low blood sugar are emphasized so often that I wish to point out first of all how such a condition may be advantageously utilized. When the blood sugar drops, the counter-regulatory mechanism of the body, through stimulation of the sympathetic system, tends to relieve the resultant hypoglycemia by favoring the discharge of glycogen from the liver. If this counter-regulation goes too far and the liver glycogen is depleted unduly, the liver acts less well in furthering carbohydrate metabolism. Under such conditions even acidosis is said to occur, just as it does as a result of uncontrolled diabetes when the liver is deprived of glycogen and is filled with fat. This state of an approaching depletion of glycogen in the liver can be forestalled by the administration of carbohydrate, and if this is done at such a time, i. e., when the blood sugar is already low and falling, apparently it is very well tolerated, so well in fact that the favorable phenomenon has been noted by patients. They frequently report that if at the first sign of an insulin reaction they take carbohydrate, it is tolerated so well that it counts as a pure addition to the carbohydrate allowance, and they need not deduct it from the subsequent meal. In treating coma, if the blood sugar is reduced to 0.05 to 0.08 per cent often for twenty-four hours, carbohydrate is utilized remarkably well, with little or no insulin.

AVERAGE DOSE

The average daily dose of insulin taken by the insulin-treated diabetic patient is probably about 30 units. This dosage is rising rather than falling, first, because the quantity of carbohydrate in the diabetic diet has been steadily going up throughout the country, and, secondly, because the proportion of patients with severe diabetes is much greater, particularly children and young adults, who owe their preservation to insulin. For one diabetic child who formerly survived ten years I suppose there are 100, and perhaps 1,000 today.

How Many Grams of Carbohydrate Will One Unit Metabolize?—This question no one can answer. There are always adjustments required for exercise and diet. Even if these two factors are constant, the improvement of the condition of the patient overthrows one's calculations. Then too there are many complications in diabetes that affect the clinical potency of the unit. In diabetic coma several units may be necessary for the utilization of 1 Gm. of carbohydrate, but, as acidotic symptoms subside, 1 unit of insulin becomes more efficacious. The crippling effect of infections on the power of insulin is well known. Other factors are discussed under the section entitled Insulin Resistance. In general, the value of a unit decreases with the number given and follows the law of a diminishing return for the power expended, as with a gasoline engine. The first

ten units is more effective than the second ten, and so on. There is another factor: insulin cannot act with greatest efficiency unless given an opportunity to display its power. An orator needs an audience to show what he can do, and insulin needs carbohydrate. Thus it has been shown repeatedly by those inaugurating the higher carbohydrate diet that the carbohydrate can be doubled with little or no additional requirement for insulin, provided total calories are controlled. But I am still somewhat skeptical. In table 1 are recorded comparable groups of thirty diabetic patients with their diets and insulin dosage, representing as a matter of fact the insulin dosage used in my clinic over a series of years. The figures show no tendency to an increase in the carbohydrate equivalent of a unit, and no increase for the total dextrose. I confess that I do not understand why these groups of my patients do not show a greater carbohydrate equivalent for 1 unit of insulin. All will agree that the whole human machine works better when a substantial amount of carbohydrate is being burned and that carbohydrate and fat metabolism profit by avoidance of either extremely low or extremely high respiratory quotients. Exceptionally there may be no lack of carbohydrate to burn, but it may be in a form that is not combustible. Thus, plenty of carbohydrate may be administered in the diet to a patient with hemochromatosis, but because the glycogen storage facilities of the body are impaired, particularly in the liver and skin (perhaps also in the muscles), insulin may not find any glycogen on which it can act. This is only one of the many states in which insulin is not blamable. In general 1 unit of insulin will metabolize 1 or 2 Gm. of carbohydrate, and perhaps even from 3 to 6 Gm.; Newburg even says 7, but it is impossible to say definitely, because one never knows how many units the patient's pancreas is producing each day or at the moment. Therefore it is dangerous to prescribe insulin in arbitrary or schematic fashion; in general the method of trial and error should be adopted, always erring on the side of low and frequent rather than of high and single dosage. Whenever I read that for each gram of dextrose lost in the urine or given intravenously 1 unit of insulin should be injected, I shrug my shoulders and exclaim *Prenez garde!*

METHODS FOR ADMINISTRATION OF INSULIN

Many methods for the introduction of insulin into the body other than by the needle, subcutaneously or intravenously, have been tried and found wanting and do not merit discussion in this article. Theoretically, aside from the disadvantages of puncturing a vein, one would expect the intravenous route to be more effective than the subcutaneous, but it has been discarded, perhaps to an unjustifiable extent, because a portion of the insulin introduced is excreted in the urine. For this reason even in coma we always give insulin subcutaneously whenever we give it intravenously. To avoid the necessity of frequent injections of insulin, attempts have been made to administer it in oil at infrequent intervals. These too have failed.

If insulin is given in the superficial layers of the skin, it is said to be more effective than when injected into the deeper layers. How true this is I do not know. At any rate one avoids the superficial layers, because if insulin is so injected it is apt to give rise to insulin burns or blisters, owing to the mechanical effect of the solution injected.

Site of Injection.—The site of an injection of insulin should be changed so frequently that not more than one dose is given in the same spot in a month. Children, partly from their desire for routine, prefer no alterations in location, and also partly because frequent injection in the same area destroys the sensibility of the skin and subcutaneous tissue. When so administered the insulin is poorly absorbed and its effect to a greater or less degree nullified. Furthermore, infections at the site of injection may result more easily. Recently an uncontrolled fat diabetic girl showed abscesses in the upper part of the thigh, where she asserted no insulin had been injected. Although she very likely spoke the truth, these probably did follow the introduction of insulin, the infection having spread along the lymphatics, an explanation that has been suggested for insulin atrophies occurring at a distance from the point of injection. For convenience it is well for patients to construct an insulin map of the body on which points of insertion for the needle for a month can be recorded, and thus surely one can avoid duplication of site. Another ruse to capture the attention of the patient is to say "Use the right leg in the morning, the left leg at night and follow a line down the anterior aspect of the leg for a week, moving outward to a new line each succeeding week of the month."

Other localities for insulin injection include the arms, particularly the deltoid and triceps regions, the upper, not the lower portions of the buttocks, and the abdominal wall. In the last-named situation, needles shortened to three eighths of an inch can be employed. The needle best liked by my patients is half an inch long and 26 gage.

Insulin Prescriptions.—Orders for the giving of insulin can be expressed simply. Most patients and nurses understand that 10—0—0 signifies ten units before breakfast; 15—0—10 means 15 units before breakfast and 10 before the evening meal, and 20—10—15—2 indicates insulin before each meal and also on retiring. These are orders for definite doses, but such cannot be employed during infections and coma and usually after operations. Under such circumstances one can use the formula $\frac{R\ Y\ G\ B}{15\text{–}10\text{–}5\text{–}0}$ in which 15—10—5 or 0 units below the line are to be given according to the red, yellow, green or blue results of the Benedict test, expressed above as *R, Y, G, B;* the qualifying time period in hours can be added—thus, every 6—4—3—2—1—½ hours. Obviously the range in the number of units can be altered to meet the requirements of the individual case or of an emergency. In coma, particularly, the time interval is frequently revised; during a half day this may be changed from every half hour to every one, two, three or four hours, according to the progress of the case.

Measuring Insulin.—The danger of confusion in measuring the dose of insulin is real. Patients fail to comprehend that a unit is a unit and that whereas 1 cc. of U-10 insulin contains 10 units, 1 cc. of U-20 insulin contains 20 units, 1 cc. of U-40 insulin contains 40 units and so on up to U-100 and more. In order to guard against errors it is well to verify the patient's dosage at each visit. Even a clergyman and a doctor make mistakes, and patients who have taken insulin over a period of years are just as likely to be wrong in their reports as those just beginning. Partly for this reason, the simplest type of syringe is desirable and this I have found to be one marked only with divisions into

tenths of one cubic centimeter. We now use almost entirely the 40 unit strength, thus reducing the volume of fluid (insulin) required at an injection.

Time for Injection of Insulin.—The maximum effect of an injection of insulin occurs in an hour, in contradistinction to that of the peak effect of food on the blood sugar, which takes place in half that time. Neither statement is absolute; the latter particularly is subject to variation. Absorption from the digestive tract is so irregular that our surgeons do not countenance the administration even of such simple liquids as orange juice, water oatmeal gruel or ginger ale within three and even four hours before the time of an operation, for fear of the patient vomiting on the operating table. And, since the adoption of this plan, I am told by the nurses that patients tolerate food after operation more satisfactorily. The blood sugar is often higher before and rises higher after breakfast than before and after the other meals; hence insulin is given at a longer period before breakfast. This period is most commonly thirty minutes but may be increased to forty-five or even sixty minutes. Convenience is an indication that often lessens the interval to fifteen minutes or less at noon and night.

The Sabbath was made for man and not man for the Sabbath and this must not be forgotten when dealing with insulin. Patients are ingenious and intelligent and often devise the ways and means best adapted for the management of their own cases. It is a good thing to allow them considerable latitude. There should be no regimentation in diabetes; the physician should seek to develop the individual's initiative.

CONTRAINDICATIONS

Insulin Anaphylaxis.—Localized anaphylactic phenomena develop frequently about the area of injection when treatment with insulin is begun. In a few days, rarely as long as a few weeks of repeated injections, it is the rule for these allergic manifestations gradually to disappear. They were far more common when insulin was first discovered, presumably owing to impurities with protein. Should these local areas of sensitization fail to disappear or plainly grow less within two weeks, it is well to change to insulin made from another animal, or it may suffice to use insulin prepared by another pharmaceutical firm. In no case have we been obliged to give up or even to consider giving up treatment of a diabetic patient with insulin on account of such phenomena.

Insulin Lumps.—Under "site of injection," attention was called to the harmfulness of repeating injections of insulin in the same area. As a rule, tumefactions result and, if the injections are long continued, necrosis of the subcutaneous tissue occurs. Such tissue is more readily susceptible to infections and, in fact, about the only infections one sees as a result of the use of insulin take place in such regions. Obviously, insulin given in such an area is poorly absorbed; it was pathetic to hear a patient say that he always took his insulin in a given area, where, as a matter of fact, there was a tumefaction, because if he injected elsewhere he would bring on a reaction! Therefore, patients should be impressed that, if insulin is scattered, less insulin will be required.

Insulin Atrophies.—Insulin atrophies are far more annoying, disfiguring and more permanent than insulin anaphylactic phenomena or insulin lumps. These occur as a rule at the exact site or near the site at which insulin has been administered. In contrast to insulin lumps, which are tumefactions of the skin and subcutaneous tissues as a result of repeated injections in one place, areas of insulin atrophy are characterized by depressions of the surface of the skin with almost complete disappearance of the subcutaneous fat and sometimes of muscle tissue also. Usually these dells on the surface of the body are replaced within a year if these regions are avoided in the course of treatment, but occasionally they persist for a much longer time. They are deforming and the physician should include in the routine visit of the diabetic patient to his office search for these and for insulin lumps, just as he checks the insulin dosage and inspects the patients' feet, lungs and tongue, and carries on his regular physical examination.

The cause of these atrophies is not known. It is evidently not due to the antiseptic tricresol, which at one time was used in the preservation of insulin. It does not appear to be due to injury of muscular tissue. Indeed, occasionally the atrophic areas are remote by several centimeters from the point at which the insulin was injected. We have seen what we considered to be such areas on the face when all possibility of a connection with local injections seemed out of the question. It is plausible to conclude that the areas may develop at a considerable distance from the site of actual injection by transference along the lymphatics, but it is difficult to explain by this theory these facial areas. These areas are not alone disfiguring; they may rarely be so extensive as to render the continuance of treatment a matter of difficulty. They occur in children and adults, in both sexes, and exceptionally in patients whose diabetes is controlled. Similar atrophies are reported sometimes to follow the use of other glandular extracts, such as posterior pituitary extract.

The treatment of insulin atrophies resolves itself into their prevention. There is no treatment for them when formed. Such patients must exercise scrupulous care in their selection of needles and in deft insertion of them. High strengths of insulin are preferable, such as 80 or 100 units per cubic centimeter, in order to reduce the volume of fluid injected. Patients have been advised to change from pig to beef insulin or vice versa and to try one preparation on one half of the body and the other on the other half, but thus far no satisfactory conclusions have been reached. Insulin atrophies make a pretty problem for research. Their solution might unlock the door to many other problems of fat metabolism.

INSULIN REACTIONS

Overdosage of Insulin.—Symptoms of an overdose of insulin, for practical purposes, are identical with those resulting from a fall in the percentage of sugar in the blood below normal. Often they are said to develop when the blood sugar is at a normal level or even above. Such instances have not come to the personal attention of the authors of this article, and we subscribe to this statement, realizing fully that a few excellent clinicians hold an opposite opinion. It is certainly true that sudden falls of the blood sugar from high levels to levels only slightly below 0.10 per cent (100 mg. per hundred cubic centimeters of blood) give rise to symptoms of a reaction that would never be felt under ordinary conditions. Confusion occurs in the patients' minds regarding an insulin reaction when they

note the characteristic symptoms and yet find the urine loaded with sugar. They do not realize that the glycosuria they have demonstrated by their Benedict test represents sugar that passed through the kidneys hours or at least minutes previously and then was retained with the urine in the bladder. In a true reaction a second freshly passed specimen of urine will be found to be sugar free, provided the bladder was thoroughly emptied at the previous micturition.

When a diabetic child becomes quiet, lacks interest and is unnaturally good; when a diabetic adult acts ambitionless, depressed and morose, or an elderly man or woman weak and faint, I wonder if their blood sugar has fallen below normal. Very likely they are hungry but do not know it. If the occasion is some hours after meals, particularly if they have had an active period of exercise and I learn that they took their usual dose of insulin and in haste ate less than usual, I feel reasonably sure that my guess is correct. And the surmise changes to certainty if I find a tremor in the hands with moisture in the palms and a few beads of sweat on the forehead. Diabetic patients in such a condition respond to questions like an automaton and somehow give the impression that soon they may become unconscious or, quite the reverse, become emotionally unstable. Dilated pupils, firm rather than soft eyeballs, diplopia, pallor rather than a red face, normal respiration and blood pressure, and normal or sometimes rapid pulse nearly complete the picture, which, if unchecked by the taking of carbohydrate, may end in complete unconsciousness followed by convulsions. The latter state may last for hours and infrequently end in death —the result of an overdose of insulin leading to a severe insulin reaction with extreme hypoglycemia.

Hypoglycemia with signs such as these constitutes the picture of an insulin reaction to all in this clinic, and we expect its relief with the giving of 5, 10 or more grams of dextrose. No patient has died of an insulin reaction at the New England Deaconess Hospital, but three of our patients, living many miles away and not under our care, and two others seen in consultations have succumbed: One, a young girl, was found unconscious as the result of a reaction which the attending physician mistook for diabetic coma; she was given 200 units of insulin and failed to recover consciousness in the course of thirty-six hours. Another patient, a young man, similarly succumbed after 60 units. The third patient, a child, died after an exhausting illness when the apathy, extreme weakness and unconsciousness were ascribed to the illness and left untreated. The diagnosis in the last case was missed in an excellent clinic partly because sympathy for the child delayed a venous blood sugar test (at that time a method for a capillary blood test was not available). Recently a fourth patient, a school teacher, returned to her home at 6:30 p. m. and behaved queerly. When a physician arrived thirty minutes later she was unconscious and having convulsions. Unable to obtain a urine test, he diagnosed coma and gave 200 units of insulin during the night. The next day, the hypoglycemia was recognized and treated with intravenous dextrose until the blood sugar was well above normal, but she died. In a fifth case hypoglycemia developed every afternoon because the physician tested the blood sugar only before breakfast and increased the insulin dose each day because the fasting blood sugar was high. This patient recovered consciousness with 10 Gm. of dextrose given intravenously, lapsed one hour later and again recovered with a second such injection. One hour later she again lapsed into unconsciousness and died when dextrose injection was delayed. The prognosis of an insulin reaction is almost invariably good if it is diagnosed reasonably early. Recognition is vital, as the foregoing cases show. For this reason table 2 is inserted, because it contains the salient points of differential diagnosis between an insulin reaction and diabetic coma.

Treatment of Insulin Reactions.—Treatment of an insulin reaction is simple; 5 or 10 Gm. of dextrose orally usually relieves the patient in a few minutes. Occasionally three times as much is required, and sometimes it is necessary to inject the dextrose intravenously, in which case as a rule the response is so prompt that before 10 cc. of a 50 per cent solution is introduced recovery has occurred. The longer the duration of an insulin reaction and the deeper the unconsciousness, the more carbohydrate is required; in one of the fatal cases seen in consultation, 200 Gm. of dextrose was given intravenously and subcutaneously before the blood sugar began to rise.

TABLE 2.—*History, Symptoms and Signs; Differential Diagnostic Points Between Diabetic Coma and Insulin Reactions* *

	Diabetic Coma	Insulin Reactions
1. Onset	Slow, days	Sudden, minutes
2. Food	Too much	Too little
3. Insulin	Too little	Too much
4. Presence of an infection	Usual	None
5. Thirst	Extreme	Absent
6. Hunger	Absent	Frequent and extreme
7. Vomiting	Common	Seldom
8. Pain in abdomen	Frequent	Absent
9. Fever	Frequent	Absent
10. Skin	Dry	Moist
11. Tremor	Absent	Frequent
12. Vision	Dim	Double
13. Appearance	Florid, extremely ill	Pale, weak and faint
14. Respiration	Exaggerated (air hunger)	Normal
15. Mental state	Restless and distressed, gradually approaching unconsciousness	Apathetic, irritable, hysterical, gradually approaching unconsciousness
16. Urine sugar	Present	Absent or always absent in the second of 2 specimens
17. Response to treatment	Gradual improvement in hours with insulin	Sudden improvement in minutes with carbohydrate by mouth and rectum, intravenously or subcutaneously

* Joslin, E. P.: A Diabetic Manual, ed. 5, p. 126, table 14.

If the patient will not swallow, dextrose can be introduced into the esophagus by catheter through the nose. We have known no harm to result from this procedure, but we have been told of liquids having been forced on patients during a reaction and entering the lungs. Dextrose, syrup, molasses and honey have all been used. Syrup diluted with twice its volume of water can be given by rectum, but its efficacy is questionable.

Various substitutes for dextrose, such as levulose and cane sugar, have been tried, but none are quite as good. Of course, for the mild group of symptoms that accompany a slight lowering of the blood sugar, carbohydrate in any form, and I dare say even protein, might suffice.

Epinephrine will mobilize dextrose in the blood provided its precursor, glycogen, is available in the body. Consequently one can give to an adult, in a reaction that has occurred not too many hours after a meal, 1 cc. of 1:1,000 solution of epinephrine subcutaneously or half this dose for a child. But even if the injection of epinephrine is effective, it should be followed by the intake of carbohydrate, because otherwise the recovery might be only temporary.

EDUCATION OF THE PATIENT IN THE USE OF INSULIN

The education of the diabetic patient is a sine qua non to the successful use of insulin, but he will never receive the full benefit of it unless he is faithful to his other two therapeutic aids, diet and exercise, and lives an honest diabetic day. It is surprising how well insulin works, even when intelligence and common sense are feeble and ignorance profound, but it is certainly true that the faithful patient who knows the most about his disease lives the longest. After thirty-six years of interest in diabetic patients (for half of that time, perhaps one third to one half of my practice has been devoted to diabetes) I can say most emphatically that the diabetic patient whose course of treatment is guided by clinical symptoms in conjunction with and not independently of laboratory tests is the one who does the best, gets the most out of life, and suffers the fewest complications.

Education of a diabetic patient by books and pamphlets accomplishes much, but class instruction does more, because it drives home the salient features of treatment. The questions and answers that arise in the classroom leave more indelible impressions than the written word. One can explain to a diabetic class the danger of a diabetic patient using alcohol, and it carries far more weight than if said alone to that individual in the class who needs this advice the most. The simpler the questions of the members of the class and the more intimate the disclosures of their own experiences with insulin, the better for all. In diabetic camps education is easy, because it is promoted by contact and acquired involuntarily. Supplementing class instruction is the painstaking tutoring of patients by the teaching diabetic nurse in the hospital or the visiting diabetic nurse in the home. Our diabetic classes are now attended more than ever and our plans for daily individual instruction steadily increase. These statements apply I am sure everywhere in the United States and therefore I have no hesitation in making them. All this must be so, because the expense of diabetic treatment must be reduced.

DURATION OF LIFE OF THE MODERN DIABETIC PATIENT

The diabetic patient who acquires his diabetes today will survive four times as long as did the diabetic patient in the first fifteen years of this century, and perhaps longer. Therefore the plan of the campaign to control diabetes must be arranged for a long period and not for a short one. This becomes increasingly apparent, because many of the diabetic patients who are discovered today were overlooked formerly; the period between onset of the disease and diagnosis has been shortened and therefore, as a rule, the cases are of a milder character.

OCCASIONAL DANGER OF DIABETIC DIET

It is impossible to explain the therapeutics of insulin without reference to the diabetic patients' diet. The diet in and of itself can be dangerous to some diabetic patients. With the extremely low carbohydrate, high fat diets of a generation ago, we literally drove many diabetic patients into coma, and many of those who avoided immediate death later acquired arteriosclerosis. Careless dieting, on the other hand, also had its victims from ensuing loss of strength and weight and increased susceptibility to infections. Incidentally, one judges only of the efficiency of a type of treatment, no matter what its character, by the course of its faithful and intelligent followers and not by that of the ignorant and careless. Dietetic treatment pays only if adjusted to the age, weight and occupation of the patient. Even the rapid reduction of weight of a fat diabetic patient may expose him to so high an endogenous fat diet as to produce acidosis, and with that a lowering of the efficiency of both endogenous and exogenous insulin.

Delayed Absorption of Food—A Menace to an Insulin-Treated Diabetic Patient.—The absorption of food by a diabetic patient is not always according to Hoyle, even if the food is quantitatively and qualitatively correct. Too often the patient and the physician conclude that food given reaches the circulation at once, and insulin is administered on that supposition. Our experience with our surgical patients, as I have already said, taught us the contrary. Food, even soluble food, may remain unabsorbed in the digestive tract for long periods with disastrous results to the patient who has taken his dose of insulin. Emotion is the chief cause for the delay and therefore emotional states must be avoided at meal times by all diabetic patients. One of the severest reactions in the literature was that recorded by Millard Smith in a child who had just eaten a full meal but did not absorb it, and until she vomited it left her doctors in a quandary.

INSULIN IN RELATION TO EXERCISE

Exercise tends to lower the blood sugar in the diabetic patient in whose body there is an adequate supply of insulin, whether this is of endogenous or of exogenous origin. This effect is so striking and so beneficial that exercise along with diet and insulin is now accorded a definite and prominent place in the everyday treatment of diabetes. Patients themselves recognize and make use of the principle. Unless an accompanying condition contraindicates activity, diabetic patients should not be kept in bed but rather must be encouraged to take regular, daily exercise. Through muscular activity, food tolerance improves and higher diets with smaller dosages of insulin are possible. This is most strikingly shown in the much lower insulin requirement of diabetic children while in summer camps as compared with the larger need during the winter when they are in school and relatively inactive. The "insulin reaction" that may follow unusual or strenuous exercise in the well controlled diabetic patient is a matter of common knowledge.

Before insulin became available in 1922, clinicians had recognized that, whereas patients with milder grades of diabetes profited by exercise, those with severe or poorly controlled diabetes were made worse. This is undoubtedly correlated with the fact that when, at the time of the exercise, the diabetic patient is deficient in insulin, muscular activity causes a rise and not a fall in blood sugar. This can readily be demonstrated by allowing a patient with moderately severe or severe diabetes to exercise in the morning before insulin or breakfast has been given. Determinations made at frequent intervals during and following the exercise under such conditions will show that the immediate effect is a definite rise in blood sugar. If a small dose of insulin is then given, further exercise causes a greater fall in blood sugar than would be expected from the insulin itself. There is some evidence to indicate that

in certain patients the taking of food may so stimulate bodily insulin secretion that postcibal hyperglycemia may be lowered by exercise following the meal. Here also, however, the endogenous insulin supply must undoubtedly be of a certain adequacy for this effect to be secured.

The practical application of such studies is clear. Not only must patients with diabetes of higher grades of severity receive insulin but, if at all possible, they must exercise regularly. The insulin dosage must be large enough to maintain a well controlled diabetic condition and then this regular exercise will exert its maximum benefit.

The favoring effect of exercise on the utilization of carbohydrate and the lowering of the blood sugar must be borne in mind whenever insulin is prescribed. As a rule the dose of insulin outside the hospital should be less than that in the hospital, and it is usually wise to reduce the insulin allowance of a patient when he is discharged.

Improvement of the diabetes and along with it of the general condition of the patient will take place with almost any kind of intelligent diabetic treatment if faithfully followed. With insulin the possibilities for improvement have been greatly augmented, and such gains both doctor and patient must be alert to recognize. Tolerance for carbohydrate may advance so rapidly that insulin reactions occur needlessly; frequently the need for insulin disappears. The physicians who advocate and prescribe insulin most freely are naturally the ones most frequently to reduce and omit it. Insulin is insurance during an infection; patients should learn how they can take advantage of this insurance when the emergency of an infection arises. Undoubtedly many persons started on insulin are allowed to drop it, and the older the patient the higher the percentage. It is known that, when many old diabetic patients die, the symptoms of the diabetes have so far subsided that even the word "diabetes" does not appear on the death certificate. With children, reduction in the quantity of insulin often is accomplished safely but its omission is seldom permissible.

The danger of rapidly becoming sugar free was recognized before the discovery of insulin by changes resulting from an alteration of the water balance of the body. Disturbances of vision would follow and it would require an interval of one or two weeks before they would clear. With insulin the same symptoms may occur and it is common for the patients to complain of failing eyesight, which one must urge them not to attempt to rectify immediately with glasses. Generalized edema is a far more troublesome complication; it is due largely to retention of water accompanying the storage of carbohydrate. As a rule it disappears of itself, but this can be hastened by restriction of salt and by the use of diuretics.

INSULIN IN DIABETIC COMA

The introduction of insulin has lowered the incidence of the mortality from diabetic coma in the total diabetic mortality (authors' series) from 60 per cent in the years from 1898 to 1914 to less than 5 per cent in a recent compilation (1930-1933). Insulin has reduced the mortality of diabetic coma itself to 11.9 per cent. In children under 15 years the mortality of diabetic coma (authors' entire series) was 1.3 per cent (seventy-eight attacks); in adults above the age of 20 years it was 20.5 per cent (thirty-two deaths in 156 cases). The mortality in the very old, surprisingly, was somewhat lower than in those of middle life. In the last forty-nine successive cases of diabetic coma treated there has been one death.

Coma is the crucial test of the efficacy of insulin or, indeed, of any diabetic remedy. But the use of insulin in coma can never be by rule of thumb. One patient will recover with 780 units, and another may recover, or at least has recovered, with 28 units. How, therefore, shall one proceed with the dosage of insulin when confronted with a case of diabetic coma?

The principles underlying the treatment of diabetic coma are four: (1) promotion of the utilization of carbohydrate by the use of insulin, because in this way the acidosis is most effectively corrected; (2) correction of the dehydration that is invariably present; (3) protection of the circulation (*a*) by maintenance of a glycogen reserve in the heart through the administration of insulin and carbohydrate and (*b*) by the correction of an abnormal mineral balance by supplying sodium chloride and water, subcutaneously and intravenously, in order to prevent renal block and anuria; (4) relief of a dilated stomach by lavage and of obstipation by enema.

How many units of insulin should one give at the first dose? To answer this question requires careful thought. The more recent the onset of the diabetes, the shorter the duration of the symptoms of the acidosis, the less severe their character as measured by the carbon dioxide of the blood, the greater the freedom of the patient from complications, notably infections, the better the condition of the circulation and especially the more nearly normal the blood pressure, and the less subnormal the temperature, the less is the amount of insulin required. Therefore, our rule is to give insulin at intervals of thirty minutes instead of in one large dose, because this allows time for the study of all the circumstances attending the development of the coma. Often the treatment of the complications plays an important factor indirectly by lessening the severity and shortening the duration of the coma.

Usually the first dose of insulin is between 20 and 40 units, but it may be as low as 5 units or as high as 100 units. If the circulation is obviously poor and sluggish and the temperature subnormal, a duplicate dose of insulin is injected intravenously, and the extremities are massaged and other measures are employed to raise the temperature of the body to normal. The initial dose is repeated almost invariably in half an hour, but after that at half-hour, hourly or less frequent intervals as indicated by the change in the patient's symptoms and signs, as indicated by mental clarity, respiration, and especially by the blood pressure, and by the changing volume of carbon dioxide in the blood, the percentage of blood sugar, the volume of urine and its content of diacetic acid and sugar. As soon as one detects a favorable response to treatment, the quantity and frequency of injections of insulin are decreased; one is alert to prevent a fall of blood sugar to a hypoglycemic level and avoids this by administration of carbohydrate. The second and third twelve-hour periods in the recovery of a case of coma demand close attention, because too easily will the patient revert into the coma state. To obviate this the urine or blood must be examined at least every two or three hours at first and later every four hours; diet and insulin dosage must be adjusted accordingly.

Various authors give one large dose of insulin at the inception of the treatment of coma, believing it to be more effective. Some authors give dextrose, 1 Gm. per insulin unit, to prevent insulin reactions and to allow more carbohydrate to be burned and thus more rapidly to overcome acidosis. We have felt it more desirable to treat the disease diabetes rather than the condition acidosis and to give carbohydrate only when the disease is coming under control and tolerance for carbohydrate is being reestablished. We have felt that our 293 cases with 11.9 per cent total mortality, our single death among seventy-eight attacks in children and only one death in the last forty-nine coma cases justify adherence to our present methods. As for alkalis, they have not been administered by us since 1917 and we know of no evidence that would warrant our resuming their use. Others who have used alkalis in the past have reduced the dosage that they originally prescribed from a hundred or more grams first to 50, then to 30 and then to 20, below which, it is acknowledged even by a former advocate of alkalis, they can have no material effect. Yet one finds lingering in the books recommendations that the stomach be washed out in coma with a 5 per cent solution of sodium bicarbonate and that a few hundred cubic centimeters be allowed to remain in it, or with still less a scientific basis that an enema be administered and 10 or 15 Gm. of sodium bicarbonate be retained; of the latter we know that but little will be absorbed.

The liberal use of physiologic solution of sodium chloride, always slowly administered, subcutaneously, intravenously, seldom rectally, will offset the dehydration and help to protect the blood pressure. Occasionally, for the latter purpose, 50 mg. of ephedrine sulphate may be introduced dissolved in the saline solution, or 1 cc. of 1:1,000 epinephrine hydrochloride may be added to each 500 cc. of the salt solution. Not once in the course of treatment of 293 cases of coma have we seen the heart embarrassed by the volume of saline solution, which at times has reached 4 or 5 liters in the course of twelve hours. When premonitory signs of anuria have appeared or even actual anuria, it has been possible in several instances to bring it to an end by the intravenous injection of 40 cc. of 10 per cent solution of sodium chloride once or twice in eight hours. Perhaps transfusion will avail, but of that we have some doubt and little experience.

For the maintenance of glycogen in the heart muscle we depend on insulin, but when the blood sugar begins to fall, and at any rate within twelve hours of the commencement of treatment, we give carbohydrate orally (ginger ale, orange juice or water oatmeal gruel not over 100 cc. an hour) or dextrose intravenously, planning to keep the carbohydrate at about 150 Gm. in twenty-four hours.

It seems necessary to make these statements about the treatment of coma because they represent measures that must go on simultaneously with the use of insulin.

Always with a diabetic patient in coma the physician should watch for the coincidence of pulmonary tuberculosis or for its development within the subsequent three years, as Root found in 8 per cent of our cases.

The commonest causes of coma are breaking the diet, the omission of insulin and the development of infections. Breaking the diet is needless, but the development of infections often is unavoidable. As for the omission of insulin, it is true that nearly one fourth of those who begin insulin later can omit it, but insulin should never be omitted without watching the effect on the urine. It is more essential to teach a patient with diabetes to test the urine when he is not taking insulin than when he is taking it.

Nausea, vomiting and diarrhea are serious in diabetes and can lead both to diabetic coma and to an insulin reaction. If a diabetic patient goes long without food, acidosis develops as in a normal individual; hence diabetic patients should never go long without eating. Temporary fasting for twelve hours more or less may be advantageous, but today no one, I believe, would wish to prescribe a fast for a longer period. In severe diabetes with nausea, vomiting or diarrhea, the lack of food leads to acidosis, the lack of water to dehydration, and if to these two factors is added the omission of the insulin on which the patient's life has depended for years, the onset of coma can be prompt. Conversely, if as a result of nausea and vomiting the meal that has been preceded by insulin is lost, it is easy to understand that the blood sugar may fall too low and an insulin reaction ensue. Consequently, no matter what the status of a diabetic patient, he should not go long without food and I therefore say to my patients "Never stop eating and as long as sugar shows in the urine never stop insulin, and whenever in doubt about the interpretation of symptoms, err on the side of taking soluble carbohydrate such as the coma diet of ginger ale, water oatmeal gruel and orange juice." These rules hold for sea sickness, for periods both before and after surgical operations, for infections of all kinds, and for confinements.

INSULIN IN THE OLD AND YOUNG

In the very young and in the very old, insulin should be begun with small but frequent doses. To the old this is particularly reassuring, and later gratifying, when they see that the doses have been reduced from three to two, often to one and frequently omitted altogether. They soon learn that insulin means insurance for them in time of need and become thankful that they have learned about it. The young, at the onset of their diabetes, and the old respond quickly to insulin, and by the use of frequent small doses one escapes reactions which at the beginning of treatment one desires to avoid in these two age groups especially. Not uncommonly diabetic children respond so well to treatment with diet and insulin that one is puzzled to know whether they really do have diabetes after all. In such cases, months are necessary to clarify the diagnosis. And in elderly persons persistence in a suitable dietetic regimen with insulin yields such excellent results that it is easy to overdose the patient.

INSULIN IN HEART DISEASE

An unfounded prejudice exists against the use of insulin in heart disease. It is true that it is of serious concern to lower unduly the sugar in the blood supplying the heart muscle. In diabetes the glycogen content of the heart muscle is high in contradistinction to that of other muscles in which it is low. Presumably in the heart of a diabetic person the glycogen is high to protect it and to make it as easy as possible for this organ to function properly under varying conditions. Be that as it may, it is an incontrovertible fact in our experience that patients with incompetent hearts have been benefited rather than harmed by the use of insulin. Never have

we seen any reason to withhold it in reasonable doses. Knowing the necessity for avoidance of hypoglycemia, we always include sufficient carbohydrate in the diet, change diets slowly and begin insulin in small doses. Thus, in commencing the treatment of an old man with 5 per cent glycosuria, I began with 3 units of insulin before lunch and before dinner and advanced to 5 units before each meal the next day; if with slight increases in insulin it takes a week for such a patient to become sugar free, I do not begrudge the time spent, and I am confident that the damaged heart will be all the better for the insulin. As a matter of fact, this patient improved so much in a few days that I discharged him with 5 units once a day.

INSULIN RESISTANCE

The reporting of cases of insulin resistance or insulin refractory diabetes is now becoming about as uncommon as did that of acute fulminating diabetes after the introduction of undernutrition by F. M. Allen and the improvement in diabetic procedure which that method wrought. Soon after the introduction of insulin it developed that insulin resistance did not exist in children, and little by little it was found out that, after eliminating one complication after another, no adult with uncomplicated diabetes remained who belonged in this category. Before even harboring the thought of insulin resistance one should investigate and be absolutely sure that diet, blood sugar tests, collection and analysis of urine, as well as the quantity and quality of insulin, are as stated and that the insulin is injected in previously untraumatized sites, so that it will be absorbed. If all these requirements are fulfilled, the overwhelming majority of all insulin resistant cases will vanish. Next, one excludes inactivity or destruction of the glycogen reservoirs through lack of muscular exercise, as in passive bed rest or arthritis, through disease of the glycogen-holding cells of the liver, as in hemochromatosis, and, again in various disorders of the skin, some of which are as simple as sunburn. Then renal glycosuria is ruled out, and this is not as easy as it seems; I confess to have overlooked this diagnosis in one case for nine years along with competent doctors in two other cities. Frequently in gangrene with an arteriosclerotic basis and in arteriosclerotic disease of the heart and kidney there occurs for a time what appears to be insulin resistance, just as high blood sugars persisted in such cases even before the discovery of insulin; but just as formerly, and now more rapidly, after the removal of the gangrene these cases respond when dietetic treatment is adequate and prolonged. Overfunction of pituitary, thyroid or adrenal may tend to counteract the effectiveness of insulin, but such states are very different from true insulin resistance. It is not always easy to detect hyperactivity of one or another of these ductless glands and, should this not be detected when existent, the case seems most obscure. One patient required 32 units of insulin and lost weight until a substernal thyroid was found, but with its removal all need for insulin vanished so completely that it required a sugar tolerance test some months later to disclose that the diabetes was not actually cured. Infections of all sorts lead to insulin resistance and at present the evidence points to the destruction or neutralization of the exogenous or endogenous insulin rather than to lack of insulin formation. Last of all comes acidosis, and in its presence resistance is manifest, disappearing rapidly with its relief.

INSULIN IN NONDIABETIC STATES

Although little is known concerning the effect of insulin on the carbohydrate metabolism in nondiabetic persons, certain observations indicate that it has a field of usefulness, particularly when undernutrition is a problem. A temporary loss of carbohydrate tolerance during the administration of insulin has been noted in certain patients and also in experimental animals. However, in Blotner's studies the tolerance always returned to normal. Various explanations for this temporary glycosuria, on the ground of a change in the permeability of the glomerular membrane, an increased rate of absorption from the intestinal tract, or a temporary decrease in pancreatic function have been offered, but none seem to have been generally accepted.

Thin, undernourished individuals whose emaciation is due to poor appetite can be helped to take more food. The practice of using insulin in nondiabetic patients to increase weight began in 1923 and was soon adopted for nondiabetic tuberculous cases. The mode of its action is not entirely clear. Insulin is only one of many factors influencing appetite and nutrition, and not all patients with tuberculosis react to its use in the same way. F. M. Allen advised beginning with 5 units three times a day and increasing to 40 units three times a day. The protection against shock depends not so much on large quantities of carbohydrate as on the repeated administration of such small amounts as 10 Gm. Occasionally much larger doses of insulin were given. Individualization of the dosage should be emphasized, especially in cases in which tuberculosis of the adrenals or liver is present. In such cases dangerous hypoglycemia may occur. Gains in weight of 60 pounds (27 Kg.) or more in a few months together with improvement in strength and spirits frequently are reported and are said to be maintained after insulin is stopped. However, all writers agree that insulin is an adjunct and is not to be substituted for any of the regular forms of treatment for tuberculosis.

Renal glycosuria should not be treated with insulin. The fundamental characteristic of renal glycosuria is the constant occurrence of glycosuria even with a normal blood sugar, irrespective of the amounts of carbohydrate ingested. Therefore if insulin is given without study of the blood sugar under a misapprehension of the nature of the glycosuria, the dose may be increased to dangerous levels at which severe hypoglycemia will develop.

HYPERINSULINISM

Under the title hyperinsulinism have been grouped an increasing number of cases of "hunger" disease (Seale Harris) or spontaneous hypoglycemia. The symptoms of hunger, nervousness, sweating, fainting, epileptiform convulsions and unconsciousness, usually relieved by food or by dextrose given intravenously, are due to the hypoglycemia, whether its cause is truly oversecretion of insulin or, as in some instances, a disease of the liver or adrenals. The variety of nervous and mental symptoms, as well as cardiac and abdominal symptoms, makes the condition an important one for internist and surgeon alike to bear in mind.

The pathology of the condition has been studied at operation and after death. Hyperplastic islet cells have been found at autopsy in two children (cited by Harris) and in a physician cited by Mosenthal. In some cases at operation normal appearing pancreases have been found. Adenomas and carcinomas of the islets of Langerhans have been shown to produce even in

their metastatic lesions large amounts of insulin (Wilder). It must be remembered that hypoglycemia may occur in certain types of hepatic diseases, in diseases of the pituitary, thyroid and adrenal glands (especially Addison's disease), and Harris urges the study of all other possible causes of hypoglycemia before the diagnosis is made of hyperinsulinism in epileptic patients.

The diagnosis may be made tentatively from the clinical symptoms, and from the relief of mild symptoms by frequent carbohydrate feeding and a high fat diet. Blood sugar values below 0.06 per cent following a dextrose tolerance test should be watched, especially since in some cases epileptiform seizures have occurred when the blood sugar fell to 0.05 per cent. Such attacks may be produced by giving test doses of insulin, but this procedure is not advised.

81 Bay State Road.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

CENCO THERMELOMETER ACCEPTABLE

(Electrical Thermometer)

Manufacturer: Central Scientific Company, 1700 Irving Park Boulevard, Chicago.

This temperature recording instrument is especially adaptable for taking the temperature of a patient receiving fever treatments.

The Thermelometer makes use of two sets of thermo-elements or thermal junctions, one set of two in series being contained in the heat sensitive element, the other or reference junction being located in a sealed chamber, the temperature of which is held constant to within 0.01 degree F. A difference in temperature between the two sets of thermal junctions produces a potential difference, which is impressed across the terminals of a micro-ammeter calibrated to read from 95 to 110 F. in one-fifth degree divisions, thus corresponding to a clinical thermometer. A heat sensitive junction is confined in a tube connected to a long heavy insulated wire, and it is suitable for taking rectal temperatures.

Cenco Thermelometer.

An electro-finished aluminum case contains all necessary parts except the heat sensitive element, which is removable. A removable metal cap protects the thermoregulator head and reference thermometer. Toggle switches on the front of the case control all electrical circuits, and a "bull's eye" with pilot light behind it affords a visible indication that the instrument is operating. A magnifier above the temperature scale facilitates quick readings. A substantial leather strap makes the Thermelometer readily portable. Its shipping weight is 75 pounds.

This unit was tried out in a clinic acceptable to the Council, and the investigations substantiated the claims made by the manufacturers pertaining to its accuracy. The unit seemed rugged and well made and has been under observation for over one year. The unit is not accurate when the fever treatments are given by short wave diathermy units.

In view of the favorable report, the Council on Physical Therapy voted to include the Thermelometer in its list of accepted devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. PAUL NICHOLAS LEECH, Secretary.

IMBAK PREPARATIONS NOT ACCEPTABLE FOR N. N. R.

Imbak is the group title applied to a series of several nondescript preparations distributed by Ernst W. Abicht of New York and manufactured by Deutsche Imbak Gesellschaft of Frankfort-on-Main, Germany. Apparently Imbak (numbers 1, 2, 3, 6 and 10) is some sort of bacterial preparation derived from the lactic acid-forming group. It enjoys the same type of absurdly uncritical promotion typical of many products of foreign origin that have been and are being marketed in this country (some of which have been the subject of Council reports in the past; e. g., Iodo-Mangan, Sulfuryl-Monal, Colloidine, Quicamphol, Pinnecksin, Hernial, Atychol, Valamin. Tersul Hiller, Promonta, Iodeol, Borosedine, Tryptoferm, Eubetin, Antiopin, Propeptans, Naiodine, Edwenil). Of course, there are also worthy foreign preparations which have been presented by those who understand what constitutes evidence of an acceptable character to gain the confidence of the American physician.

Imbak was presented to the Council by Ernst W. Abicht of New York, whose main business seems to deal with paper converting machinery. All of the varieties are stated to consist of "only pure natural products, free from all artificial chemicals." The process of manufacture is described:

"By means of a special prociding, which is protected in all civilised countries, lastic acid bacteries according to Metschnikoffs prescription are developed in best pure milk of the Alps, and all other superflours, or even damaging microbes exterminated" [sic].

No other statement of composition is submitted, nor, in fact, is there any mention of dosage or mode of administration recommended. Deficient though the submission may be in these respects, the therapeutic claims are far from modest. One or the other of the numerical modifications (and here the correlation between a given disease group and the corresponding "number" of the Imbak line indicated therein is frequently not apparent) are recommended in the treatment of the following conditions: intestinal and pulmonary tuberculosis, typhoid, dysentery (amebic as well as other forms), psoriasis, arthritis deformans, arteriosclerosis, diabetes, cholera, malaria, trypanosomiasis, syphilis, "and some more."

The value of Imbak in these various disease states allegedly has been attested to by Prof. Dr. Kessler of the Tung Chi University, Shanghai, and Dr. med. A. Stein, doctor of the State Penitentiary Hospital, Frankfort-on-Main. Prof. Dr. Kessler has not applied the product to as widely diverse fields of medicine (and surgery) as Dr. med. A. Stein, but he claims to have obtained beneficial results in rickets, intestinal catarrh, constipation and "dyspepsy." Dr. Stein, however, seems most enthusiastic (although apparently proportionately less critical than Prof. Dr. Kessler) in his statements:

"CANCER

"With regard to cancer it has been possible during the last *two weeks* [italics ours] to treat two cases notwithstanding it is very difficult to persuade patients to undergo a new cure which has not yet come into publicity, also in this case it has been shown in a most evident fashion that justly these diseases which hitherto have cause the greatest difficulties to Doctors were extinguished [sic] in a few weeks. . . . The results up to now obtained with the different patients, who partly are still under treatment, is highly promising, so that already this day we can affirm that at last we have in our hand this means, which act directly on the different causes of diseases, destroying them. This invention is to be put in the same line which the salvarsan occupies as the Therapia Magna Sterilisans."

It would, indeed, promise a glorious era in medicine were such an omnipotent preparation produced, but in this case clinical, pharmacologic and therapeutic evidence to support even a small fraction of the claims is totally lacking; and in consideration of the rather extensive knowledge already established concerning the lactic acid-forming organisms it appears questionable that such properties, even in a small part, may ever

be properly attributed to Imbak or to any similar product, irrespective of the regrettably premature predictions of Prof. Dr. Kessler and Dr. med. A. Stein.

The Council declared Imbak and the submitted dosage forms not acceptable for New and Nonofficial Remedies because Imbak is a semisecret preparation marketed under a noninforming name (rules 1 and 8), promoted with unwarranted and absurd therapeutic claims (rule 6).

This proposed report was submitted to the manufacturer. The firm applied for reconsideration and submitted additional information on the products. The Council considered this information to be wholly inadequate as evidence for acceptability. The firm states that Imbak has many forms in addition to numbers 1 to 10. Number 37 and numbers 40 to 75 are claimed to be useful in the treatment of typhoid fever, tuberculosis, diabetes, obesity, asthma, bronchitis, arteriosclerosis and other diseases. The Council held that this additional material serves only to confirm its declaration of the unacceptability of Imbak.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

MINNESOTA BRAND AMBEROLLS—ELBOW MACARONI
MINNESOTA BRAND ELBOW MACARONI—AMBEROLLS
MINNESOTA BRAND LONG MACARONI
MINNESOTA BRAND LONG SPAGHETTI
MINNESOTA BRAND MACARONI ALPHABETS
MINNESOTA BRAND MACARONI RINGS
MINNESOTA BRAND MACARONI SHELLS
MINNESOTA BRAND SPAGETS—ELBOW SPAGHETTI
MINNESOTA BRAND VERMICELLI

Manufacturer.—Minnesota Macaroni Company, St. Paul.

Description.—Macaroni of various shapes prepared from durum semolina.

Manufacture.—Durum semolina is kneaded with water under corrugated steel rolls, forced through dies containing holes of appropriate diameter and shape to form the various types of macaroni, partially dried and packaged.

Analysis (submitted by manufacturer).—	per cent
Moisture	10.0
Ash	0.7
Fat (ether extraction method)	0.9
Protein (N × 5.7)	13.6
Crude fiber	0.6
Carbohydrates other than crude fiber (by difference)	74.3

Calories.—3.5 per gram; 99 per ounce.

Claims of Manufacturer.—Complies with the United States Department of Agriculture definition and standard.

PETER PAN SLICED SANDWICH BREAD

Manufacturer.—Cottons, Inc., Baton Rouge, La.

Description.—Sliced white bread made by the sponge dough method (method described in THE JOURNAL, March 5, 1932, p. 817); prepared from flour, water, cane sugar, powdered skim milk, lard, yeast, salt, condensed milk and a yeast food containing wheat flour, sodium chloride, calcium sulphate, ammonium chloride and potassium bromate, malt extract syrup, and corn and soya bean flours.

BOB WHITE BRAND FANCY TABLE SYRUP GOLDEN

Manufacturer.—The Torbitt & Castleman Company, Inc., Louisville, Ky.

Description.—Table syrup; a blend of corn syrup (90 per cent) and refiners' syrup (10 per cent).

Manufacture.—Corn syrup, prepared as described in THE JOURNAL, March 5, 1932, page 817, and refiners' syrup, which complies with the United States Department of Agriculture standard for that product, are mixed in the stated proportions, heated to 70 C. and automatically packed in air tight cans.

Analysis (submitted by manufacturer).—	per cent
Moisture	24.0
Ash	0.9
Fat (ether extract)	0.0
Protein (N × 6.25)	0.2
Reducing sugars as dextrose	32.6
Reducing sugars as dextrose after inversion	38.7
Sucrose	5.8
Dextrins (by difference)	36.2
Titratable acidity as HCl	0.03
Sulphur dioxide as SO_2	0.001
pH	5.6

No methods are available for accurately determining the composition of syrups of this nature; therefore the foregoing analysis is roughly approximate.

Calories.—3.0 per gram; 85 per ounce.

Claims of Manufacturer.—Recommended for use as an easily digestible and readily assimilable carbohydrate supplement to milk in infant feeding and as a syrup for cooking, baking and the table.

WILSON PURE TOMATO JUICE

Distributor.—Ira Wilson & Sons Dairy Company, Detroit.

Packer.—The Loudon Packing Company, Terre Haute, Ind.

Description.—Tomato juice in bottles; retains in large measure the vitamin content of the raw juice used; contains a small amount of added salt. The same as Loudon Brand Tomato Juice (THE JOURNAL, June 25, 1932, p. 2289).

1. BOHACK'S GRAPEFRUIT
2. HALE'S PRIDE FANCY GRAPEFRUIT

Distributors.—1. H. C. Bohack Company, Inc., Brooklyn and Long Island, N. Y. 2. Hale-Halsell Company, McAlester, Okla.

Packer.—Dr. P. Phillips Company, Orlando, Fla.

Description.—Canned sliced Florida grapefruit sweetened with added sucrose and retaining in large measure the original natural vitamin content; the same as Dr. P. Phillips Florida Fanci-Cut Grapefruit Slices (THE JOURNAL, Nov. 19, 1932, p. 1781).

DURKEE'S VEGETABLE OLEOMARGARINE

Manufacturer.—Durkee Famous Foods, Inc., Chicago, Norwalk, Ohio, and Berkeley, Calif.

Description.—Margarine prepared from hydrogenated refined cottonseed oil, pasteurized cultured milk, salt, derivative of glycerin, and sodium benzoate (0.1 per cent).

Manufacture.—Hydrogenated refined cottonseed oil is heated to 41-43 C. and churned with pasteurized cultured milk. The resulting emulsion is solidified by spraying into a vat of ice water, worked to remove excess moisture, blended with salt, cultured milk, derivative of glycerin (emulsifying agent), and sodium benzoate; cooled to 17 C., molded into prints, and automatically wrapped and packed in cartons.

Analysis (submitted by manufacturer).—	per cent
Moisture	14.8
Ash (other than sodium chloride)	0.1
Sodium chloride	3.4
Fat (ether extract)	80.1
Protein (N × 6.25)	0.4
Lactose	0.5
Sodium benzoate	0.1
Glycerin derivative	0.5

Calories.—7.2 per gram; 204 per ounce.

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SATURDAY, AUGUST 3, 1935

EFFECT OF CHOLECYSTECTOMY ON HEPATIC AND RENAL FUNCTION

Although much information is available regarding the functions of the gallbladder, there are still certain phenomena apparently related to the activity of this structure that remain unsolved. Particularly is this true in the case of certain metabolic disturbances that may follow the removal of the gallbladder, most notable among which are alterations in hepatic and renal function. At first thought it seems improbable that the mere removal of the gallbladder, a structure known to be nonessential to mammalian life and presumably functioning chiefly in the concentration and storage of bile, should exert any deleterious effects on other organs. However, instances of serious postoperative morbidity and even death following simple cholecystectomy have been described in patients who were apparently in good condition before operation. The most careful preoperative examination may fail to reveal any significant hepatic or renal functional impairment; cholecystectomy may be performed without undue trauma; the anesthesia may not produce noticeable untoward effects, and still the patient may show evidence of profound functional disturbances, particularly of the liver and kidneys, and may die within a few days after operation.

Questions naturally arise concerning the nature of the hepatic and renal changes following cholecystectomy. The majority of the experimental studies dealing with hepatic alterations have been concerned with the morphologic aspects of the problem. Recently, however, variations in the functional efficiency of the liver have been followed.[1] Simple cholecystectomies were performed on a group of sixty patients with cholecystitis; there were no obstructions of the common duct and the subjects were not clinically jaundiced. Nitrous oxide and ether infiltration or spinal anesthesia was employed; in no case was the common duct manipulated, nor were other operative procedures performed. All the patients were in good clinical condition before and during the operation, and there were no fatalities. As indexes of liver function, the bilirubin content of the serum and the degree of retention of bromsulphalein were determined.

The data obtained indicated that in the majority of cases there is a slight transitory increase in serum bilirubin and in the retention of the dye, suggesting a temporary impairment of the excretory function of the liver. The increase in serum bilirubin was more constant in cases that did not show preoperative hyperbilirubinemia; the degree of dye retention, however, appeared to bear no constant relation to the extent of the preoperative or the postoperative bilirubinemia. Patency or occlusion of the cystic duct appeared to be of importance in determining the incidence of these postoperative functional abnormalities. Hyperbilirubinemia and increased retention of bromsulphalein were observed in a large majority of the cases in which there were patent cystic ducts, whereas these changes occurred in relatively few of the group showing obstruction of the duct. The probable explanation for this difference is that physiologic compensation, as described by an earlier investigator,[2] to the lack of functional activity of the gallbladder had already occurred in the latter group. The postoperative increases of serum bilirubin and retention of dye eventually disappeared in every case, although in some instances one or the other persisted for as long as four days. An explanation of these results is difficult. Apparently the effects of the anesthetic were of relatively little importance, as no correlation existed between the duration and type of anesthesia and either the incidence or the severity of the postoperative changes. It is possible that the effects observed may be related to an alleged decrease in the rate of flow of bile following cholecystectomy. Such a change would undoubtedly favor the retention of bilirubin and of bromsulphalein.

Impairment of renal function following cholecystectomy has also been repeatedly observed. Patients with chronic cholecystitis and apparently normal renal function have been known to develop profound uremia following operation. Careful examination of the kidneys of these patients at necropsy frequently reveals a marked necrosis of the tubular epithelium, with focal hemorrhages and patchy areas of leukocytic infiltration. The appearance of the kidneys is distinctly different from the appearance of these organs in biliary nephrosis. Recent histologic studies[3] on the kidneys of patients with calculous cholecystitis who died following operation have yielded further confirmatory information; distinct regressive cellular changes in the renal tubular epithelium were observed. Several hypotheses have been advanced to explain these phenomena. One postulates that the renal damage may be due to the toxic

1. Cantarow, Abraham; Gartman, Edward, and Ricchiuti, A. G.: Hepatic Function: III. The Effect of Cholecystectomy on Hepatic Function, Arch. Surg. **30**: 865 (May) 1935.

2. Puestow, C. B.: The Discharge of Bile into the Duodenum: An Experimental Study, Arch. Surg. **23**: 1013 (Dec.) 1931.

3. Lieber, M. M., and Stewart, H. L.: Renal Changes Following Biliary Obstruction, Decompression and Operation on the Biliary Tract, Arch. Path. **19**: 636 (May) 1935.

effect of split protein products from damaged, autolyzing hepatic tissue; these toxic products are then supposed to exhibit an elective affinity for parenchymatous and vascular tissues, producing angiospasm and progressive degeneration and necrosis of the tubular epithelium. Neither this nor other theories, however, satisfactorily explain the pathogenesis of all the renal changes following cholecystectomy.

The foregoing unsolved problems regarding functional impairment of the liver and kidney following simple cholecystectomy emphasize again the complexity of interrelations of organs and also the fact that alterations in the activity of one body tissue are frequently reflected by compensatory changes in remote and often unexpected places.

A CRYSTALLINE PROTEIN HAVING THE PROPERTIES OF A VIRUS

The nature of viruses has been a matter for speculation since Iwanowski [1] demonstrated in 1892 that the infective agent causing the mosaic disease of tobacco plants could pass through a porcelain filter. This was the first known virus. Iwanowski's work was confirmed independently by Beijerinck.[2] Loeffler and Frosch [3] in 1898 showed that the causative agent of foot and mouth disease also is filtrable through a porcelain candle. Since then more than a hundred filtrable agents belonging to the class now known as viruses have been demonstrated to cause disease in plants and animals.

Many difficulties beset the efforts of investigators to determine the nature of viruses. Some have held that they are living organisms; in view of the fact that viruses do not propagate except in the presence of living tissue and because of their behavior in other respects, some have suggested that these infective agents are nonliving poisons.

The recent announcement made by Stanley [4] of the Rockefeller Institute is therefore of great importance. Stanley has reported the separation from the juice of Turkish tobacco plants infected with the mosaic disease of a crystalline protein that has the properties of tobacco-mosaic virus. The material was obtained in the form of fine needles, which contain 20 per cent of nitrogen and 1 per cent of ash. The substance is precipitated by a variety of protein precipitants; it is practically insoluble in water but is soluble in dilute acid, alkali or salt solutions. In all respects it behaves like a typical protein.

The crystalline substance produced typical tobacco-mosaic disease on inoculation into tobacco plants; the activity of the crystals was more than 100 times that of a suspension made by grinding up the leaves from diseased plants. The infectivity, chemical composition and optical rotation of the crystalline protein were unchanged after ten successive crystallizations. Collodion filters through which the protein did not pass also did not permit the infective agent to pass. The newly isolated compound was held back by collodion membranes through which proteins such as egg albumin passed readily; this and other experiments indicate that the molecule of the crystalline protein is very large, having a molecular weight probably of a few million. The protein was inactivated by heating to 94 C., a temperature at which the virus is also destroyed.

The serums of animals injected with tobacco-mosaic virus gave a precipitate with solutions of the crystals in dilutions up to 1:100,000; this did not occur with the serums of animals injected with the juice of healthy tobacco plants. Conversely, injection of solutions of the crystals into animals produced precipitins against the crystalline protein and against the juice of infected but not against that of normal plants.

Stanley regards the tobacco-mosaic virus "as an autocatalytic protein which, for the present, may be assumed to require the presence of living cells for multiplication."

It is too early to speculate on the eventual significance of this fundamental contribution, with regard to its relation to virus diseases in animals or to other virus infections of plants. The concept of nonliving poisons propagated by or in the living cells which are attacked by the poisons has received consideration since it was proposed by Sanfelice in 1914.[2] Stanley's work provides experimental support for this theory.

1. Iwanowski, D.: Bull. Acad. Sc., S. Pétersbourg, 1892.
2. Cited from A System of Bacteriology in Relation to Medicine, Medical Research Council, His Majesty's Stationery Office, London, 1930, volume VII, pp. 13 and 14.
3. Loeffler, A. J., and Frosch: Deutsche med. Wchnschr. **24**: 80, 1898.
4. Stanley, W. M.: Isolation of a Crystalline Protein Possessing the Properties of Tobacco-Mosaic Virus, Science **81**: 644 (June 28) 1935.

SULPHUR THERAPY

The utilization of sulphur for medicinal purposes was described as early as the time of Pliny,[1] who attributed therapeutic value to this element in a wide variety of ailments. Medical interest in sulphur has been stimulated by the preparation of this material in forms [2] whereby it may be introduced intramuscularly and intravenously. Much has been written concerning the wide therapeutic value of sulphur, but its use in widely different fields suggests that the theoretical basis of sulphur medication is largely empirical. As a result, the many beneficial results attending the administration of sulphur have been accompanied by a certain proportion of unfavorable prognoses. For example, the failure to observe aseptic precautions during intramuscular administration of preparations of sulphur in oil has frequently led to periostitis; in some instances the dangers of an oil embolism have been encountered. Notwithstanding these difficulties, injections of sulphur in oil have been widely employed within recent years in the treatment of a variety of conditions.

1. Pliny: Natural History, book XXXV, chapter 50, London, George Bell Sons, 1856.
2. Debus, H.: J. Chem. Soc. London **53**: 278, 1888.

The Danish clinician Schroeder [3] first suggested the use of a preparation of sulphur in oil in the treatment of dementia paralytica and certain other nervous and mental disorders. The primary object of the therapy is to produce a series of pyrexial bouts; any favorable results that ensue are usually attributed to the beneficial effects of the fever. The therapeutic value appears primarily to be a general reaction associated with the rise of temperature, although some claim a specific sulphur effect. The results of Schroeder have been extensively studied by English investigators. In contrast to the rapid and dramatic results which he described, subsequent experimentation has produced comparative failure.[4] Recently, a study [5] of a series of twenty-three cases of dementia praecox treated with a preparation of sulphur in oil gave slight indications of improvement, although it was difficult to distinguish between therapeutic improvement and spontaneous amelioration. One of the most characteristic effects of the sulphur injections appears to be a leukocytosis. This phenomenon has been studied in some detail both in man and in rabbits by Power [6] and has been demonstrated to be due to an increase in polymorphonuclear cells. Furthermore, the leukocytes that appear in the circulation under these experimental conditions have been shown to exhibit, under in vitro conditions, a considerable degree of phagocytic activity.

Probably the most beneficial results of sulphur therapy have been claimed in dermatology. This is particularly true with the advent of new preparations. Miller [7] has recently presented an interesting report of the uses that have been suggested for colloidal sulphur in dermatology, together with personal observations made in a wide variety of dermatologic conditions. Interesting comparisons have been made between the therapeutic value of colloidal sulphur and that of other forms of sulphur therapy. The application of this element in colloidal form was of no value for cutaneous conditions that in the past have not responded to other types of sulphur treatment. However, colloidal sulphur seemed to produce improvement in many instances in seborrhea, seborrheic dermatitis, acne rosacea, acne vulgaris and dermatomycosis. It also proved to be of value when applied as wet dressings in cases of subacute eczema and dermatomycosis. Certain types of fungous infections, for example ringworm of the feet, responded well to colloidal sulphur therapy. The latter treatment was, however, of little value in scabies, psoriasis or instances of pyogenic infections.

These results, together with cases reported by other investigators, may stimulate the use of sulphur as a therapeutic agent in dermatology. Sulphur in the colloidal form should be employed in much lower concentrations than those used for other forms of sulphur. It is generally advisable to use the material in less than a 5 per cent solution, and it requires considerable experience to determine the exact strength needed and the most suitable base or dispersion medium for the preparation. All preparations should be clear, free from an odor of hydrogen sulphide, of a p_H of approximately 5.0, and correctly standardized as to sulphur content.

3. Schroeder, Knud: Lancet **2**: 1081 (Nov. 23) 1929.
4. Patterson, W. G., and Switzer, S. R. C.: Lancet **2**: 348 (Aug. 16) 1930.
5. McCartan, William: Lancet **1**: 340 (Feb. 13) 1932.
6. Power, T. D.: Lancet **2**: 1289 (Dec. 13) 1930; **1**: 338 (Feb. 13) 1932.
7. Miller, H. E.: Colloidal Sulphur in Dermatology, Arch. Dermat. & Syph. **31**: 516 (April) 1935.

Current Comment

SIGNIFICANCE OF CALCIUM ION CONCENTRATIONS IN THE BLOOD

At least part of the diffusible calcium in the blood serum is in the form of free ionic calcium. There is reason to believe that this form is of primary physiologic importance. Two schools of thought, both supported by experimental evidence, have developed with regard to the state of this diffusible calcium. One has held that all or nearly all the calcium not bound to protein is ionized. The other believes that, of each 5 mg. of calcium not bound to protein, not more than 2 mg. can be in the ionized state. In order to account for the remaining 3 mg. a diffusible form of calcium, bound to some citrate-like substance, as yet unidentified, has been postulated. In view of the uncertainty as to the conditions present in the fluids of the normal body, it is not surprising that interpretation of abnormal observations has been a source of great difficulty. To the clinician this has meant (1) that a normal figure for the total calcium of the serum might possibly conceal an abnormal distribution between the various forms, and (2) that no sound basis has existed for clinical interpretation of abnormal fluctuations in the total calcium level. The key to these difficulties lies in the possibility of making direct observations of ionic calcium concentrations. McLean and Hastings [1] have reported a method designed to resolve this problem. They used the isolated heart of the frog, already known to be extremely sensitive to changes in the calcium content of its nutrient fluid. It had been previously [2] shown that this sensitivity could be reduced to quantitative terms. The ionic calcium concentration in normal human fluids was found to be in the neighborhood of 5 mg. per hundred cubic centimeters of fluid, and this held true whether cerebrospinal fluid, containing a total of 5 mg. of calcium per hundred cubic centimeters, or a serum containing twice this amount was examined. It thus appears that all or nearly all the calcium in protein-free fluids is present in ionized form and that in protein-containing fluids, such as serum, plasma, pleural fluid and ascitic fluid, ionic calcium and calcium bound to protein are together sufficient to account for all or nearly all the total calcium. There thus seems no further reason to propose quantitatively significant amounts of a third form of calcium in the fluids of the

1. McLean, F. C., and Hastings, A. B.: Clinical Estimation and Significance of Calcium Ion Concentrations in the Blood, Am. J. M. Sc. **189**: 601 (May) 1935.
2. McLean, F. C., and Hastings, A. B.: A Biologic Method for the Estimation of Calcium Ion Concentration, J. Biol. Chem. **107**: 337 (Oct.) 1934.

normal human body. It can scarcely be doubted, however, that a small but insignificant amount of bound but diffusible calcium, corresponding to the small amounts of citrate present in human fluids, does exist in these fluids. The calcium-protein relationship was next investigated, and this study led to the discovery that the ionization of calcium in protein-containing fluids is determined by a chemical equilibrium between calcium and protein. With the demonstration that the distribution of calcium between ionic calcium and calcium bound to protein depends on the total protein present, it becomes possible to calculate ionic calcium concentrations from values for total calcium and total protein. The first conclusion is that values for ionic calcium concentrations as calculated from total calcium and total protein are in substantial agreement with the values obtained from direct observation by the frog heart method. The usual and simple method for calculating ionic calcium concentrations from total calcium and total protein thus appears entirely adequate for ordinary clinical use.

Association News

NEW REGULATIONS CONCERNING INJURED EMPLOYEES OF WORKS PROGRESS ADMINISTRATION

The Emergency Relief Appropriation Act of 1935 provides that the provisions of the Federal Employees' Compensation Act are extended, as far as applicable, to employees of the Federal Civil Works Administration for disability or death resulting from traumatic injury sustained while in the performance of duty. Traumatic injury includes "only injury by accident causing damage or harm to the physical structure of the body and shall not include a disease in any form except as it shall naturally result from the injury."

The administration of the Federal Employees' Compensation Act is vested in the United States Employees Compensation Commission, Washington, D. C., the commission being authorized to make necessary rules and regulations for the carrying out of the purposes of the act. Pursuant to this authority, the commission, July 15, 1935, promulgated Rules and Regulations No. 1, Governing Compensation and Medical Expense for Works Progress Administration.

SUMMARY OF RULES AND REGULATIONS NO. 1

The term "employee" includes only persons receiving security payments or wages from funds made available by the Emergency Relief Appropriation Act of 1935 for services rendered as employees of the United States. The term "physician" includes only graduates of a recognized medical school with a degree of M.D. who are licensed to practice medicine in the state in which they reside. The term "state compensation officer" as used in the regulations refers to the person on the staff of each State Works Progress Administrator who is charged with the duty of supervising the handling of compensation claims.

MEDICAL TREATMENT

Employees of the Works Progress Administration who suffer a traumatic injury while in the performance of duty, whether or not disability arises, are entitled to necessary medical and hospital care. Treatment will not be authorized for illness or disease in any form except as it may naturally arise from a traumatic injury by accident, causing harm or damage to the physical structure of the body. No provision is made for medical examinations to determine employees' physical qualifications for work.

Where practical, medical treatment is to be furnished by federal medical establishments, but these facilities may not be utilized to the exclusion or disadvantage of any other beneficiary for whom they have been specifically provided. Where federal medical facilities are not available, or where such facilities are inadequate to furnish the necessary services, the state compensation officer or his local representatives are authorized to make arrangements for medical care by reputable private physicians.

Medical fees are to be paid at rates not in excess of the minimum charges prevailing in the community for similar services. The regulations provide that the state compensation officer or his local representatives should contact the local medical societies to enlist their cooperation in selecting physicians in the locality who are especially well qualified to render services in industrial accident cases and who desire to render such service to employees of the Works Progress Administration, under the regulations of the commission. The fact that a physician, otherwise qualified, is not a member of a medical society is not to be considered in a way discriminatory to him. Compensation cases are to be distributed among physicians in as equitable a manner as possible.

A physician authorized to treat an injured employee may select the institution in which a patient is to be hospitalized, provided such institution agrees to the approved schedule of rates. The commission has agreed with representatives of the national hospital associations on basic rates with general hospitals for services to Works Progress Administration employees. The commission reserves the right to have its medical representatives examine patients and their records at the hospital and to cause a patient's removal for sufficient reason.

AUTHORITY FOR TREATMENT

Where there is no doubt concerning the right of an employee to receive medical care, special form CA-16, or a letter containing the information required by that form, must be issued by the person in charge of a project or the compensation representative, in sending an injured employee to a physician or hospital for treatment. The request is made in duplicate and the original is left with the physician or hospital.

If there is doubt whether or not an employee is entitled to medical and hospital care, the person in charge of the project, or the local compensation representative, should send the employee for an examination, using special form CA-17. If the examination discloses that the employee is not entitled to treatment, the local compensation representative or other person who issued form CA-17 should immediately notify the physician or hospital that no treatment should be rendered for the account of the commission. If the local compensation represensative is in doubt concerning the matter, he is to refer all details and circumstances to the state officer for advice. If the state officer entertains doubt, he is to refer the facts to the commission, at Washington, D. C., for decision. Form CA-17 authorizes necessary emergency treatment.

Form CA-16, or form CA-17, is the physician's authority for rendering services for the account of the commission, and bills cannot be paid in the absence of such authority. The regulations provide that authorization for treatment of an injured employee should not be issued to more than one physician; if a second physician is necessary, the attending physician has full authority to procure such assistance as he may deem necessary. If, however, a change of physicians becomes advisable, authority for treatment is to be issued to the physician to whom the case is transferred.

Authorization for treatment, the regulations provide, should be issued on the date of the injury or on the date the employee applies for treatment and should be sent to the physician at the time the employee is referred for treatment. Emergency cases may be referred before the issuance of form CA-16, provided the form is issued within forty-eight hours thereafter. When it is not practical to observe this requirement, the delay in issuing authorization must be explained—otherwise payment for medical services may be refused. All authority for treatment or hospitalization should be signed personally by the issuing officer. The name of the issuing officer typed on the form is not to be considered valid authority.

Attending physicians may engage special nursing service when such care is absolutely essential, without written authorization by the compensation officer. The commission's allowance for

hospitalization covers all general nursing service. The necessity for special nursing must be shown in each case. Vouchers submitted by nurses must contain a certification that they are not employed on a salary basis in the hospital in which the service was rendered, and these vouchers must be approved by the attending physician.

HERNIAS

Special provisions are embodied in the regulations with respect to hernias. Form CA-17 should be used in all hernia cases. In general, no hernia operation is to be authorized by the state compensation officer, but such cases must be reported to the commission at Washington for authorization to proceed with the operation. In an emergency, however, "due to strangulation or incarceration," when it is clear that the complication is due to injury on a Works Progress Administration project, an emergency operation may be authorized locally. The provisions of the commission's general regulations promulgated under the Federal Employees' Compensation Act, relating specifically to hernias, are made applicable to cases of hernias developing in connection with the Works Progress Administration activities.

PREPARATION OF VOUCHERS FOR MEDICAL AND HOSPITAL SERVICE

Bills for medical and hospital services are to be submitted on form S-69 and supported by proper written authority authorizing such service, either special form CA-16 or CA-17 as the case may be, unless such authorization has previously been forwarded to the commission. A separate voucher must be submitted by each payee for services to each indigent employee.

Vouchers should be verified by the signature of the injured employee. Vouchers from physicians and hospitals on form S-69 should be submitted when the employee is discharged from treatment except when hospitalization or treatment extends more than thirty days, in which case the vouchers should be submitted at the end of each thirty-day period with a complete report from the attending physician showing the condition of the employee, the diagnosis and prognosis, and recommendations with reference to any future medical care.

VOUCHERS SUBMITTED BY PHYSICIANS

The following specific instructions should be followed by physicians, in submitting voucher form S-69: (*a*) All charges must be itemized to show specific dates on which treatments were rendered, the charge for each treatment and a concise description of the injury for which treatment was rendered. (*b*) X-ray charges should be itemized so as to show the dates on which made, number of views, parts of the body roentgenographed, and the charge for each service. (*c*) Joint accounts will not be authorized for payment. If the service of an assistant or consultant is required, the assistant or consultant must submit a separate voucher. (*d*) Physicians and hospitals must not submit a combined account. (*e*) Vouchers from physicians shall include a separate charge for drugs and must show whether such drugs were supplied from personal stock. If not, a receipted bill supporting the charge must accompany the voucher. All charges for drugs must be itemized.

VOUCHERS FOR HOSPITAL SERVICE

The following specific instructions must be followed in submitting voucher form S-69 for authorized hospital service: (*a*) Payment will be made for the day of admission but not for the day of discharge from the hospital, and vouchers should be submitted accordingly. (*b*) The per diem rate for hospitalization includes all drugs, dressings and laboratory work. (*c*) Payment for special drugs and supplies authorized by the attending physician will be approved. Whenever extra charges for special drugs or surgical supplies are made, the kind of drugs must be shown on the voucher and, if they are not supplied by the hospital, the amount claimed must be supported by a properly receipted bill. If not supplied from stock or supported by a receipted bill, the cost of the article should not be included in the hospital voucher and the druggist or firm supplying the articles should be instructed to submit a voucher. (*c*) All x-ray charges should be itemized as described in the preceding paragraph. (*d*) Hospitals and physicians must not submit a voucher combining the services of the two. When the physician is owner or part owner of the hospital, and accounts are submitted in the physician's name or in the name of the hospital, a separate voucher must be prepared for each class of service.

IN GENERAL

The regulations further provide, in detail, for the payment of necessary expenses incurred in the transportation of injured employees for the purpose of obtaining medical treatment, for the filing of reports of injuries, and for the payment of compensation to injured employees or their surviving dependents.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Appointments to State Medical Board.—Members of the Arizona State Board of Medical Examiners, recently appointed by the governor, and their terms of office are: Dr. John H. Patterson, Phoenix, secretary, six years; Dr. William G. Schultz, Tucson, five years; Dr. Ira E. Huffman, Tucson, four years; Dr. John E. Bacon, Miami, three years, and Charles C. Bradbury, D.O., Phoenix, two years. Dr. Bacon is a new appointee to the board.

CALIFORNIA

Society News.—A recent meeting of the Humboldt County Medical Society was addressed, among others, by Dr. Emmet Rixford, San Francisco, on "Surgery of the Gallbladder and Stomach."——At a meeting of the Lassen-Plumas County Medical Society in Westwood, May 3, it was voted to petition the state society to change the name to Lassen-Plumas-Modoc County Medical Society.——Speakers before the Orange County Medical Society, June 4, included Drs. Vernon P. Thompson on "Treatment of Fractures of the Long Bones of the Lower Extremities"; Donald G. Tollefson, "Toxemias of Pregnancy"; Charles E. Phillips, "Surgical Relief of Ulcer of the Stomach"; Pierre P. Viole, "Treatment of Sinusitis," and Edward Richmond Ware, "Coronary Thrombosis—Management and Treatment." All are from Los Angeles.——At a meeting of the San Bernardino County Medical Society in the Patton State Hospital, June 11, Drs. James J. Cecil, Patton, discussed "Syphilitic Diseases of the Brain and Spinal Cord" and Harry S. Blossom, Patton, "Dementia Praecox."——Medical economics was discussed before a meeting of the San Joaquin County Medical Society in Stockton, June 6, by Drs. Guillaume D. Delprat and Glenn F. Cushman, San Francisco.——The Tulare County Medical Society was addressed, June 2, by Dr. Edward C. Bull, San Francisco, on "Fractures About the Ankle."

CONNECTICUT

Personal.—Dr. Cornelius S. Conklin, Bridgeport, has been named president of the Bridgeport Medical Society, to fill the unexpired term of the late Dr. Daniel J. McCarthy.——Dr. Grover F. Powers, professor of pediatrics, Yale University School of Medicine, received the honorary degree of doctor of science from Purdue University, Lafayette, Ind., recently.——The University of Leeds, England, conferred the honorary degree of doctor of science on Dr. Harvey Cushing, New Haven, July 1.

DISTRICT OF COLUMBIA

Changes on the Faculty at Georgetown.—Announcement is made of the following promotions and appointments on the faculty of the Georgetown University School of Medicine for the next academic year:

Dr. Vincent J. Dardinski, professor of anatomy and director of the department; he has been associate professor of pathology and parasitology.

Dr. Reginald A. Cutting, professor of physiology and director of the department.

Dr. John A. Simpson, assistant professor in the department of pathology and parasitology.

Dr. Philip L. Martinez, assistant professor in the department of anatomy.

Dr. George J. Brilmyer, professor of pathology and parasitology.

Dr. Harold V. Connerty, assistant professor of pathology and parasitology.

GEORGIA

Personal.—Dr. Josephus J. P. Bowdoin, Atlanta, has been given a life membership in the Seventh District of the Georgia Congress of Parents and Teachers "in appreciation of his service to the children of the state."——Dr. Samuel P. Hall Jr., formerly of Chickamauga, has been named health commissioner of Walker County to succeed Dr. Rufus F. Payne, who resigned to accept a position with the CCC Camp at Fort Oglethorpe. ——Dr. Lysander P. Holmes has been appointed superintendent of the University Hospital, Augusta, succeeding Dr. John H. Snoke, resigned.

ILLINOIS

Society News.—Dr. Rolland L. Green, Peoria, president-elect of the Illinois State Medical Society, was guest of honor at the annual outing of the Peoria City Medical Society, June 27, at Luthy's Alps.——Dr. Frederick H. Falls, Chicago, discussed "Early Diagnosis of Cancer of the Uterus" before the Coles-Cumberland Counties Medical Society, July 12.

Personal.—Thomas C. Grubb, Ph.D., has been appointed a member of the professional staff of the Illinois State Department of Health and will conduct research in the control and prevention of disease. Dr. Grubb is a graduate of the University of Chicago and in 1934 shared the Ricketts prize at the university for meritorious work relating to the diphtheria bacillus. —— Dr. Grover C. Brown, Sainte Marie, has been appointed managing officer of the Jacksonville State Hospital.

Chicago

Personal.—Dr. Margaret W. Gerard, assistant clinical professor of psychiatry, Division of Biological Sciences, University of Chicago, has been promoted to be associate professor under the psychiatric program recently instituted at the university.—— The honorary degree of doctor of laws was conferred on Dr. Arthur Hale Curtis, professor of obstetrics and gynecology, Northwestern University Medical School, by the University of Wisconsin, June 24.

IOWA

Society News.—A county tuberculosis association will be established in Cerro Gordo County, in accordance with a plan adopted by the county medical society at its meeting, June 21, in Mason City. Dr. Nathaniel G. Alcock, Iowa City, discussed transurethral prostatectomy before the society at this meeting. ——Speakers before the Austin Flint-Cedar Valley Medical Society in Mason City, July 9, included Drs. Louis A. Buie, Rochester, on proctology; Lawrence E. Kelley, Des Moines, analgesia in labor, and Henry D. Holman, Mason City, therapeutic hints for the treatment of angina pectoris and coronary occlusion.

Baker Charged with Practicing Medicine.—It was reported, July 24, that Justice J. C. Coster, Muscatine, had ordered Norman G. Baker held to the September grand jury. The charge was that of conspiring to practice medicine without a license. The judge overruled a motion by Baker's attorney to dismiss the charge against him. Baker was arrested one hour after his return to Muscatine from Nuevo Laredo, Mexico, where he operates a "cancer cure" hospital and radio station. He posted a bond of $1,000. Baker's permit to operate a station in Muscatine was canceled in 1931 because of his pernicious broadcasting. Feb. 14, 1935, Baker applied for a permit to open a new broadcasting station in Muscatine; his application was denied (THE JOURNAL, March 16, p. 629).

KANSAS

Department of Medical Research.—The establishment of a department of medical research at Bell Memorial Hospital, Kansas City, as a part of the work of the University of Kansas School of Medicine, with Dr. Ralph H. Major, professor of medicine, as director, has been announced. Clarence J. Weber, Ph.D., instructor in medicine, has been named associate in medical research.

New County Societies.—The Chautauqua County Medical Society was organized at a meeting in Sedan, June 28, and the following officers were elected: Dr. Edward A. Marrs, Sedan, president; Dr. Estella M. Edwards, Cedar Vale, vice president, and Dr. Ralph S. Casford, Sedan, secretary-treasurer. Dr. Benjamin Brunner, Wamego, was chosen president of the Pottawatomie County Medical Society at its organization meeting recently in Westmoreland.

State Medical Election.—Dr. Howard L. Snyder, Winfield, was chosen president of the Kansas Medical Society at the recent annual meeting, to take office January 1, succeeding Dr. John F. Hassig, Kansas City. Other officers of the society are Drs. Lewis D. Johnson, Chanute, vice president; Harry L. Chambers, Lawrence, secretary, and George M. Gray, Kansas City, treasurer. Mr. Clarence G. Munns, Topeka, is executive secretary. The next annual session will be held in Topeka, May 6-8, 1936. The society agreed to establish a permanent committee on maternal welfare to be composed of five members, three of whom shall be obstetricians, one a surgeon and one an internist.

MARYLAND

Personal. — Dr. George O. Sharrett, Cumberland, was recently elected to fill the unexpired term of the late Dr. Henry M. Fitzhugh, Westminster, as a member of the Board of Medical Examiners of Maryland.

New Milk Regulations.—The state department of health has adopted new regulations governing the control of milk shipped, handled and consumed in Maryland. Pasteurization apparatus must be approved by the state department, according to the new requirements, and must have proper temperature control; the milk must be heated to a temperature of not less than 143.5 F. continuously for not less than thirty minutes and then properly cooled. Grades are defined as A, B and C raw milk and A and B pasteurized. Grading is not compulsory, but milk offered for sale as graded must conform to the requirements. The amended regulations do not apply to cities of more than 100,000 of population which have an organized department of health and which maintain milk supervision under state law or city ordinances; incorporated cities or towns are authorized to adopt and enforce milk regulations that are not inconsistent with those of the state board of health and to provide for the grading of milk; counties may use the same privilege.

MASSACHUSETTS

State Board Election. — At the annual meeting of the Massachusetts Board of Registration in Medicine, July 11, Dr. Charles P. Sylvester, Boston, was reelected chairman, and Dr. Stephen Rushmore, Boston, reelected secretary.

Personal.—Dr. Ernest E. Tyzzer, George Fabyan professor of comparative pathology, Harvard University Medical School, Boston, received the honorary degree of doctor of science at the annual commencement of Brown University, Providence.

Psychiatric Awards. — Dr. Calvert Stein of the Monson State Hospital received the first prize of the New England Society of Psychiatry at its recent annual meeting, for a paper on "Studies in Endocrine Therapy in Epilepsy." Dr. Minna E. L. Emch of the Worcester State Hospital was given second prize for her paper on "A Reorientation for State Hospital Psychiatry." These awards are presented annually for the best papers embodying research in psychiatry completed during the year. Dr. Horace G. Ripley, superintendent, Brattleboro Retreat, Brattleboro, Vt., was chosen president; Dr. Eugene A. Stanley, superintendent, Vermont State Hospital for Insane, Waterbury, vice president, and Dr. Harlan L. Paine, superintendent, Grafton State Hospital, North Grafton, secretary-treasurer. Dr. William A. Horsley Gantt, director of the conditioned reflex laboratory, Johns Hopkins University School of Medicine, Baltimore, spoke on the experimental approach to psychiatry.

MINNESOTA

Personal. — Northwestern University, Evanston, Ill., conferred the honorary degree of doctor of science on Dr. Henry S. Plummer, Rochester, at its annual commencement. —— Dr. Baldwin Borreson has been appointed to succeed Dr. Bethune C. Bernard as superintendent of Oakland Park Sanatorium, Thief River Falls.

Northern Minnesota Medical Meeting.—The annual meeting of the Northern Minnesota Medical Association will be held in Duluth, August 12, with the following physicians, among others, on the program:

Melvin S. Henderson, Rochester, Fractures of Neck of Femur.
John H. Moore, Grand Forks, N. D., Pelvic Inflammatory Disease.
Edward N. Peterson, Eveleth, Lung Abscess.
Richard M. Johnson, Minneapolis, New Concepts of Calcium Therapy.
Arthur U. Desjardins, Rochester, Radiotherapy for Inflammatory and Malignant Conditions.
Owen W. Parker, Ely, Fractures of the Ankle.
Clarence Jacobson, Chisholm, Management of Diabetes Mellitus in General Surgery.
James J. Swendson, St. Paul, Sterility, Its Etiology and Treatment.
Edgar T. Herrmann, St. Paul, Treatment of Pneumonia by Artificial Pneumothorax.
Herbert A. Carlson, Minneapolis, Treatment of Acute Empyema.
Gordon B. New, Rochester, Management of Malignant Disease of the Mouth and Adjacent Structures.
Rosco G. Leland, Chicago, Medical Economics.

A steamer trip along the north shore of Lake Superior is planned.

Appointments of Drs. Scammon and Diehl.—Richard E. Scammon, Ph.D., since 1931 dean of medical sciences, University of Minnesota School of Medicine, has been appointed Distinguished Service Professor of the graduate faculty of the University of Minnesota, a new position. He will be free to devote a portion of his time to research and to teach, if he wishes, in any school of the university that wants his services. Dr. Scammon, who is 52 years of age, received his degree of doctor of philosophy from Harvard in 1909. He was assistant professor of anatomy at the University of Kansas from 1910 to 1911, then went to the University of Minnesota as assistant professor. He was professor from 1914 to 1930, when he resigned to become professor of anatomy and dean of the Division of Biological Sciences, University of Chicago. In 1931 he returned to Minnesota as dean of medical sciences. He was president of the Minnesota Board of Examiners in Basic Sciences from 1927 to 1930. Dr. Harold S. Diehl, professor and head of the department of preventive medicine and public health since 1922, will succeed Dr. Scammon as dean of medical sciences. Dr. Diehl is 44 years of age and graduated in medicine at Minnesota in 1918. In addition to his professorship he has been director of the student health service.

MONTANA

State Medical Meeting and Election.—Dr. John A. Evert, Glendive, was chosen president-elect of the Medical Association of Montana at its fifty-seventh annual meeting, in Helena, July 2-3. Dr. Louis H. Fligman, Helena, was installed as president. Dr. Harry J. McGregor, Great Falls, was named vice president, and Dr. Elmer G. Balsam, Billings, was reelected secretary. The next annual meeting will be held in Billings, July 8-9, 1936. Speakers on the scientific program included:

Dr. Jay Arthur Myers, Minneapolis, Modern Aspects of the Diagnosis and Treatment of Tuberculosis.
Dr. Rosco G. Leland, Chicago, Medical Economics.
Dr. Frank E. Burch, St. Paul, Ophthalmology.
Dr. Francis L. McPhail, Great Falls, Treatment of Eclampsia.
Dr. Lloyd T. Sussex, Havre, Chronic Infections of the Urinary Tract.
Dr. John R. Vasko, Great Falls, Low Back Pain.
Dr. Herbert H. James, Butte, Treatment of Uterine Myoma and Myopathic Hemorrhage with Radium.

On Tuesday, July 2, the association held a joint meeting with the Western Branch of the American Public Health Association, which was holding its sixth annual session. Speakers at this meeting included:

John F. Kassel, Ph.D., Los Angeles, Epidemiologic and Laboratory Studies During the 1934-1935 Poliomyelitis Epidemic in Los Angeles.
Dr. Enoch M. Porter, Great Falls, After-Care of Infantile Paralysis.
Dr. Roger A. Nolan, San Diego, Infectious Mononucleosis.
Dr. Henry E. Young, Victoria, B. C., Canada, Medical Economics in Canada.

That evening both groups attended a banquet at the Consistory Temple with Dr. Balsam as toastmaster. Drs. Walter H. Brown, Palo Alto, Calif., and Charles E. K. Vidal, Deer Lodge, presidents of the Western Branch and the Montana association, respectively, were the speakers. A joint stag dinner was held, July 1; William Shea, Great Falls, spoke on "These Doctors," and Dr. Thomas F. Walker, Great Falls, "These Inspectors."

NEW YORK

Personal.—Dr. Howard H. Volan, Syracuse, has been appointed epidemiologist in the Syracuse department of health to succeed Dr. Gregory D. Mahar, who was recently made health commissioner.——Dr. Arthur R. Bowles, Mount Kisco, has been appointed assistant director of Grasslands Hospitals, Valhalla, to succeed Dr. William B. Talbot, who has been made superintendent of the New York Post-Graduate Hospital.

Annual Meeting at Chautauqua.—The Chautauqua County Medical Society sponsored its annual interstate meeting at Chautauqua, July 24, with physicians from New York, Pennsylvania and Ohio as guests. Speakers were Drs. Donald R. McKay and Raymond S. Rosedale, Buffalo, on "Primary Carcinoma of the Lung"; Walter M. Simpson, Dayton, Ohio, "Undulant Fever," and M. Herbert Barker, Chicago, "Treatment of Pneumonia.'" Dr. Joseph Colt Bloodgood, Baltimore, delivered a public address on cancer at an afternoon meeting, which was followed by the annual golf tournament.

Society News.—The Binghamton Academy of Medicine, the Broome County Medical Society and the Endicott Johnson Medical Society were guests of the Binghamton Psychiatric Society, May 27, at a meeting at the Binghamton State Hospital, at which Dr. Israel S. Wechsler, New York, discussed "Traumatic Neurosis."——The May meeting of the Seneca County Medical Society was held at Seneca Falls, with Drs. John M. Swan, Rochester, and Jacob J. Levy, Syracuse, as speakers, on cancer. Dr. John F. Crosby, Seneca Falls, was guest of honor at a dinner preceding the meeting, in compliment to his fifty-two years as a physician.——Dr. Chalmer J. Longstreet, Binghamton, was elected president of the New York State Sanitary Officers' Association at the annual meeting in Saratoga Springs, June 26, and Dr. Guy H. Turrell, Smithtown Branch, L. I., secretary.——The Lake Keuka Medical Society canceled its annual meeting, which was to have been held July 11. Lake Keuka is in the flood area.

New York City

Personal.—Dr. Stephen H. Ackerman has been appointed medical superintendent of Coney Island Hospital to succeed Dr. Marcus D. Kogel, who will be in charge of the new Queens General Hospital, the department of hospitals announced recently.——Dr. Oswald T. Avery of the Rockefeller Institute for Medical Research received the honorary degree of doctor of laws at the annual convocation of McGill University, May 30.——Drs. Maurice C. O'Shea, Lawrence M. Shapiro and Emeline P. Hayward have been provisionally appointed to the medical staff of the board of education. These positions have been vacant for several years.

Appointments at Rockefeller Institute.—Dr. Alphonse R. Dochez has been elected a member of the board of scientific directors of the Rockefeller Institute for Medical Research. Drs. Lawrence Edgar Hummel and Robert J. Parsons have been appointed assistants on the staff of the institute; Dr. William Halsey Barker and Mr. Rollin D. Hotchkiss, fellows. Promotions include the following:

Assistant to associate: Drs. Joseph W. Beard, Harry S. N. Greene, Kenneth C. Smithburn and Wendell M. Stanley, Ph.D.
Fellow to assistant: George L. Graham, Sc.D.; George I. Lavin, Ph.D.; Charles V. Seastone Jr.; William Trager, Ph.D., and Arnold J. Ullstrup, Ph.D.; Jonathan Biscoe and Joseph S. Fruton.

Neurological Institute Reorganized.—Dr. Frederick Tilney, professor of neurology and neuro-anatomy at the College of Physicians and Surgeons of Columbia University, has been appointed to the new position of medical director of the Neurological Institute in a reorganization effected July 9. Dr. Dudley D. Roberts was named vice president and chairman of the executive council, and twenty-five new trustees were added to the previous twenty-five. A new department is to be organized in association with the College of Physicians and Surgeons to develop research in physiology of the nervous system and it is also planned to enlarge the department of child neurology recently organized through the Friedsam Foundation under the direction of Dr. Bernard Sachs. Laboratory facilities will be extended to several additional floors of the institute, it was announced. In addition, ten new committees have been designated to deal with scientific matters, finance, hospital management, professional staff, nurses, outpatient department, education, buildings and grounds, publicity and community relations and law. The Neurological Institute was founded in 1909 and became a part of the Columbia University-Presbyterian Hospital Medical Center in 1929.

NORTH CAROLINA

Society News.—A symposium on acute poliomyelitis was presented before the Buncombe County Medical Society, Asheville, July 1, by Drs. Lewis W. Elias, Henry H. Harrison and George W. Kutscher Jr.——Dr. Charles M. Byrnes, Baltimore, addressed the Guilford County Medical Society, High Point, June 6, on "Functional Neuroses and Their Treatment."——A symposium on accidental injuries made up the program of the Catawba Valley Medical Society, Lincolnton, July 9, presented by Drs. Verne H. Blackwelder, Lenoir; Jefferson Bivins Helms and John S. McKee Jr., Morganton.

PENNSYLVANIA

Personal.—Dr. Louis A. Wesner, Johnstown, has been appointed medical director of the State Sanatorium for Tuberculosis at Cresson, succeeding Dr. Thomas H. A. Stites.——Dr. and Mrs. Anson J. Singer, East Stroudsburg, recently celebrated their golden wedding anniversary.——Dr. George A. Clark, Wilkes-Barre, completed fifty years in the practice of medicine, May 18.——Dr. Harry W. Howland, Gaines, has been appointed medical director of Tioga County, succeeding Dr. Charles W. Sheldon, Wellsboro.

Philadelphia

Dr. Long Appointed Director of Phipps Institute.—Dr. Esmond R. Long, director of the laboratory of the Henry Phipps Institute of the University of Pennsylvania, has been made director. Dr. Charles J. Hatfield, former director, will be associate director and chairman of the board of directors in charge of the institute. Dr. Henry R. M. Landis will have the title of associate director in charge of the clinical and sociological departments.

SOUTH CAROLINA

Lectures on Obstetrics.—Dr. James R. McCord, Atlanta, gave a series of lectures on obstetrics for practicing physicians in Columbia, July 8-12. The lectures were sponsored by the Columbia Medical Society and the South Carolina Medical Association and were attended by physicians from nine counties.

Personal.—Friends of Dr. Joseph H. Saye, Sharon, held a community celebration in honor of his fiftieth anniversary of medical practice in the town, June 1.——Dr. William A. Carrigan, Society Hill, has been appointed health officer of Darlington County.——Dr. Sedgwick Simons, Georgetown, has been assigned as health officer of Beaufort County.

TENNESSEE

Society News.—Dr. Dean DeWitt Lewis, Baltimore, addressed the Chattanooga Surgeons' Club, July 9, on "Nerve Injuries." At a banquet given in his honor, July 10, at the Chattanooga Golf and Country Club, Dr. Lewis spoke on medical economics and later addressed the Chattanooga and Hamilton County Medical Society on "Differential Diagnoses in Abdominal Conditions."——Four Memphis physicians addressed the July meeting of the Benton-Carroll-Henry-Weakley Counties Medical Society at Huntingdon, July 9, as follows: Drs. Joseph A. Crisler, "Recurrence of Carcinoma After Ten Years"; Peter Whitman Rowland Jr., "Diagnosis of Angina Pectoris"; John C. Ayres, "Common Errors in Obstetrics," and Frank T. Mitchell, "Rheumatic Fever."——Drs. Charles F. Webb, Jackson, and John L. McGehee, Memphis, among others, addressed the medical society of Hardin, Lawrence, Lewis, Perry and Wayne counties at Shiloh National Park, June 25, on acute conditions in the abdomen and appendicitis in pregnancy, respectively.——Dr. James G. Eblen, Knoxville, addressed the Knox County Medical Society, June 18, on "Treatment of Empyema in Children."

TEXAS

Hospital News.—The University of Texas and the Sealy and Smith Foundation have appropriated $200,000 for the erection of a hospital for Negroes as a unit of the John Sealy Hospital, Galveston, according to *Modern Hospital.*

University News.—Richard E. Scammon, Ph.D., dean of medical sciences, University of Minnesota, Minneapolis, delivered the commencement addresses at Baylor University College of Medicine, College of Dentistry and College of Nursing, Dallas, May 27, and at the University of Texas School of Medicine, Galveston, May 31. There were eighty-three graduates at the state university and seventy-nine at Baylor.

Personal.—Hubert S. Jackson, D.D.S., San Antonio, and Dr. William P. Harrison, Teague, have been appointed to the state board of health.——Dr. Arthur C. Scott Sr., Temple, received the honorary degree of doctor of laws from Trinity University, Waxahachie, June 3.——Dr. Thomas N. Goodson, San Antonio, has been appointed health officer of Bexar County and Dr. Lawton C. Biggers, Bonham, of Fannin County.——Dr. William B. Carrell, Dallas, has been elected a member of the International Orthopedic Association, it is reported.

WASHINGTON

Personal.—Dr. Hinton D. Jonez, Tacoma, was recently appointed health officer of Pierce County to succeed Dr. James H. Egan.——Dr. Arthur M. Sonneland, Bellingham, has been appointed health officer of Whatcom County, succeeding Dr. Johan C. Wiik.

Society News.—Dr. William A. Buice, director of laboratories at the Eastern State Hospital, Medical Lake, was elected president of the Washington State Public Health Association at its first annual meeting, held recently in Wenatchee.——Drs. Frank H. Wanamaker and Charles B. Ward, Seattle, addressed the Okanogan County Medical Society at Omak, June 12, on cancer of the lower jaw and cancer of the face and neck, respectively.

WEST VIRGINIA

Personal.—Dr. Guy Hinsdale, White Sulphur Springs, sailed June 1 to attend the meeting of the International Society of Medical Hydrology in Brussels, Belgium.——Dr. Edward R. Davies, Kingwood, has resigned as health officer of Preston County to take a similar position in Baltimore, it is reported. Dr. Davies' successor is Dr. Charles Y. Moser, Terra Alta.

Society News.—Drs. William S. Love Jr. and Charles Reid Edwards, Baltimore, addressed a joint meeting of the Monongalia, Marion and Harrison county medical societies, Morgantown, June 4, on "Differential Diagnosis and Significance of Heart Murmurs" and "Thrombosis and Embolism," respectively. The guests conducted clinics during the day at the Monongalia County Hospital.——Drs. Walter E. Vest and Fred A. Brown, Huntington, addressed the Logan County Medical Society, Logan, May 15, on "Methods of Gastro-Intestinal Diagnosis" and "Indications for Use of Digitalis," respectively.——Dr. Joseph H. Barach, Pittsburgh, addressed the Tyler-Wetzel Counties Medical Society, in June, on "Changing Views on Hypertension."

HAWAII

Graduate Lectures.—The Honolulu County Medical Society inaugurated a series of graduate lectures, June 27, when Dr. William Darrach, dean emeritus and professor of clinical surgery, Columbia University College of Physicians and Surgeons, New York, spoke on "Treatment of Fractures." Dr. George Dock, Pasadena, Calif., also spoke on appendicitis. Dr. Hugh H. Young, professor of urology, Johns Hopkins University School of Medicine, Baltimore, gave a lecture, July 8, entitled "The Prostate Gland—Its Past and Present Treatment." He also conducted a urologic seminar, July 10, at the Queen's Hospital.

GENERAL

Dr. Gardner Receives Trudeau Medal.—Dr. Leroy U. Gardner, director of the Saranac Laboratory for Study of Tuberculosis, Saranac Lake, N. Y., received the Trudeau Medal of the National Tuberculosis Association at the annual meeting in Saranac Lake, June 24. The award was made for his work on the pathology of tuberculosis, notably that dealing with the relation between tuberculosis and silicosis. Dr. Gardner, a graduate of Yale University School of Medicine, went to Saranac Lake as pathologist for the Trudeau Foundation in 1919. He became director of the laboratory in 1927.

Epidemic of Typhoid.—About 100 cases of typhoid were reported to the health department of Minneapolis between May 25 and July 15, according to Minneapolis newspapers. The department has made intensive investigation of all cases but has not determined the source of the infection. Samples of city water have been repeatedly analyzed without conclusive results. Incidental pollution was discovered in samples taken July 1 and 2 and chlorine sterilization was immediately increased.——A woman typhoid carrier in Muncy, Pa., was recently fined $50 for having prepared food for a dinner following which twenty persons became ill of typhoid and five died, according to a newspaper report, July 5.

Institute for Hospital Administrators.—The American Hospital Association will conduct its annual institute for hospital administrators on the campus of the University of Chicago, September 11-25. The program will be devoted to lectures, conferences and seminars, and students who attended the 1934 institute may select in advance one or more of the special subjects which they wish to study this year. Opportunities will be arranged for them individually to pursue these subjects intensively and they will be excused from clinics not related to their special fields. Information may be obtained from the executive secretary of the American Hospital Association, 18 East Division Street, Chicago.

Medical Bills in Congress.—*Bills Introduced:* H. R. 8941, introduced by Representative Jenckes, Indiana, proposes "to prevent the adulteration, misbranding, and false advertising of food, drugs, and cosmetics, in the commerce affected, for the following purposes, namely, to safeguard the public health and to protect the purchasing public from injurious deception." H. R. 8953, introduced by Representative McSwain, South Carolina, proposes to provide for the care and treatment of members of the National Guard, Organized Reserves, Reserve Officers' Training Corps, and citizens' military training camps who are injured or contract disease while engaged in military training.

Society News.—Dr. Roy R. Kracke, Emory University, Ga., was chosen president-elect of the American Society of Clinical Pathologists at the annual meeting in Atlantic City, June 6-8. Dr. Robert A. Kilduffe, Atlantic City, was elected vice president and Dr. Foster M. Johns, New Orleans, was installed as president.——Dr. Zoe Allison Johnston, Pittsburgh, was chosen president-elect of the American Radium Society at the annual meeting in Atlantic City, and Dr. George W. Grier, Pittsburgh, was installed as president. Next year's meeting will be held in Kansas City at the time of the annual session of the American Medical Association.——The National Medical Association will hold its annual session in New Orleans, August 11-17.

Outbreaks of Poliomyelitis.—The Virginia state department of health reports that ninety-nine cases of poliomyelitis were reported to the department from June 1 to July 12. The outbreak has been confined principally to the south central

section of the state, with sporadic cases occurring in July in other sections. Cases have been reported from twenty-five counties, among them one death. More than 300 cases had been reported in North Carolina from May 1 to July 8, with twenty-four deaths. It was announced July 13 that the epidemic appeared to be waning, fewer cases having been reported to the state health department during the preceding week than in the week ended July 6; forty-eight cases were reported in the week ended July 20, compared with fifty-two July 13. Newspapers report twenty-six cases of poliomyelitis in Kern County, Calif., with four deaths since July 1.

Milk-Borne Epidemics in 1934.—Twenty-one health departments in the United States and Canada reported forty-four milk-borne epidemics during 1934, all but one caused by the use of raw milk. According to data collected by the Conference of State and Provincial Health Authorities of North America, there were 1,382 cases of illness, with forty-seven deaths. The diseases involved in the epidemics were diphtheria, gastro-enteritis, scarlet fever, septic sore throat, typhoid and undulant fever. Typhoid was responsible for 53 per cent of the epidemics and septic sore throat accounted for 22 per cent. These two diseases were responsible for 75 per cent of the epidemics, 70 per cent of the cases and 91 per cent of the deaths. Eighteen state health departments reported forty epidemics, with 1,324 cases and forty-four deaths, and Canadian officers reported four, with fifty-eight cases and three deaths. In those in the United States, carriers and cases in dairies were reported to have been the sources of contamination in 70 per cent, cows in 27 per cent. Seventy-four per cent of the forty-two communities in which the epidemics occurred were rural communities and small towns of less than 5,000 population; only one city with more than 50,000 population had a milk-borne epidemic during 1934. Forty-one health departments reported no epidemics during the year.

Bequests and Donations.—The following bequests and donations have recently been announced:

Montefiore Hospital, New York, $31,631, and Mount Sinai Hospital, New York, $25,000 under the will of the late Isabella Kritzman.

St. Vincent's Hospital, Bridgeport, Conn., a share in the $125,000 estate of the late Dr. Daniel J. McCarthy, Bridgeport.

Children's Hospital, St. Paul, $25,000 by the will of the late Leo Vogel, Mankato, Minn.

Lankenau Hospital and Hospital of the Protestant Episcopal Church, Philadelphia, $5,000 each by the will of the late Henry Dittman.

Chestnut Hill Hospital, Philadelphia, $10,000 from the estate of Mrs. Elizabeth Cuthbert Roberts Wyatt.

Jefferson Medical College, Philadelphia, $5,000 by the will of the late Dr. Thomas McCrae.

Presbyterian Hospital, Philadelphia, $5,000 by the will of Mrs. Florence F. Craig, to be paid after the death of her husband.

St. Vincent's Hospital, New York, $10,000, and Presbyterian Hospital, New York, $7,500 by the will of Walter J. M. Donovan.

Montefiore Hospital for Chronic Diseases and Beth Israel Hospital, $6,000 each; Lebanon Hospital, $2,500, by the will of Leo Lesser. All are in New York.

Hahnemann Medical College and Hospital, Philadelphia, stock in a theater ticket printing company, valued at $22,000, by the will of the late Bertha Galland.

Methodist Hospital, Philadelphia, $2,000, and Aid Association of the Philadelphia County Medical Society, $1,000 by the will of the late Dr. Delno E. Kercher.

St. Luke's Hospital, New Bedford, Mass., $50,000 by the will of Miss Amelia Hickling Jones.

University of Wisconsin, $10,000 for the study of cancer, by the will of the late Michael W. McArdle, Chicago.

Presbyterian Hospital, Chicago, $10,000 by the will of the late Mrs. Roxana Atwater Wentworth Bowen, New York.

CANADA

Dr. Banting Honored.—Sir Frederick Banting, professor of medical research, University of Toronto Faculty of Medicine, received the gold medal of the Society of Apothecaries of London, June 4, "for valuable services rendered to the science of therapeutics." He was also made a Fellow of the Royal Society and, June 20, delivered an address on the history of insulin at the British Postgraduate Medical School, Hammersmith.

Medal Awarded for Work in Anesthesia.—Dr. Wesley Bourne, lecturer in anesthesia, McGill University Faculty of Medicine, Montreal, has received the first Hickman Medal of the Royal Society of Medicine of England. This award was founded in 1931, to be given every three years for original work of outstanding merit in anesthesia or directly related subjects. Hickman was a pioneer in the use of nitrous oxide as an anesthetic. He died in 1829.

Personal.—Dr. Jonathan C. Meakins, Montreal, president of the Canadian Medical Association and past president of the American College of Physicians, has been made a fellow of the Royal College of Physicians of London.——Dr. James B. Collip, professor and head of the department of biochemistry, McGill University Faculty of Medicine, Montreal, received the honorary degree of doctor of laws, honoris causa, from the University of Manitoba.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 6, 1935.

Bill to Check the Advertisement of Nostrums

The misleading, not to say fraudulent, claims made for nostrums, otherwise termed "patent medicines," in the advertisements of newspapers have long been a scandal. Some years ago the British Medical Association tried to deal with the evil by publishing a book on Secret Remedies, disclosing their composition and showing how most vaunted preparations consisted of very ordinary ingredients quite incapable of fulfilling the claims made for them. But the many millions of dollars spent on these advertisements shows that the evil is unchecked. At the house of commons the minister of health, Sir Kingsley Wood, received a deputation from the parliamentary committee on food and health, which also represented a number of important bodies, commercial as well as professional: British Medical Association, Pharmaceutical Society, National Pharmaceutical Union, Society of Medical Officers of Health, National Association of Insurance Practitioners, Advertising Association, Newspaper Society, Surgical Instrument Manufacturers Association and others. Captain Elliston, M. P., who spoke for the deputation, said that the parliamentary committee on food and health had in preparation for some time the draft of a bill to control the advertisement of medicines and surgical appliances. In 1912-1914 a select committee of the house of commons, at the instigation of the parliamentary committee on food and health, investigated the question and reported in favor of legislation. Then came the war. Several endeavors have since been made to introduce legislation but it had not been possible to make progress with a bill. One difficulty was to secure the agreement of the many interests concerned. The present bill had been discussed with all the important interests affected and a measure of agreement had been reached. The principal objects of the bill were: 1. To prohibit the advertisement of medicines, surgical appliances or forms of treatment as effective for the cure or prevention of certain specified ailments, such as cancer and tuberculosis. 2. To prohibit the invitation to members of the public to obtain the diagnosis or treatment of these ailments by correspondence. The bill also contained clauses safeguarding the legitimate interests of those concerned, including newspapers and religious organizations. Speaking as president of the Advertising Association, Sir John Pybus said that the bill would not affect adversely any legitimate trade interest. The Newspaper Proprietors Association had not committed itself to support the bill, but its representatives had taken part in the drafting. In view of the safeguards for the newspapers there was no need to anticipate any opposition from their association.

In replying, the minister of health said that he greatly appreciated the valuable work done by the parliamentary committee on food and health. Although many newspapers already set a high standard in the matter, legislation was undoubtedly needed. He would have the bill examined and make inquiries as to the amount of support that might be anticipated for it. If this proved satisfactory, the introduction of legislation would be considered sympathetically, if the government's general program of legislation made this possible. It may be commented on this proposal and reply that, while it would be well that unfortunate sufferers from cancer and tuberculosis should be protected against the fraudulent promises of cure, the bill touches only a small part of fraudulent advertising. Evidently the condition requiring the support of the interests concerned does not allow more to be done.

Industrial Accidents: The Greater Danger to Young Workers

In his annual report, the chief inspector of factories draws attention to a marked increase in industrial accidents, which numbered 136,858 in 1934 and 113,260 in 1933, and particularly to a high accident incidence among young workers. The number of fatal accidents in the two years were 785 and 688 respectively. The inspector points out that the adult worker has become accustomed to his environment and has—or ought to have—acquired habits of caution. The young entrant finds factory life an entirely new experience and has in addition certain qualities of youth, such as bravado and curiosity, which render him susceptible to accident. It seems that he should have an apprenticeship in safety, just as in productive work. The inspector proposes that during school life there should be instruction in industrial dangers, just as there are now in road traffic dangers. Also every entrant into industry should be taken round the factory before he starts work and shown the principal risks. Such a demonstration would be more effective than a book of safety rules. Due selection of the process on which the young entrant is to be engaged is called for and careful supervision during the early period of the employment. The inspector has been long impressed with the number of accidents in which new workers have been allowed to operate machines capable of inflicting severe injury, which should be entrusted only to experienced workers. A watch should be kept on young workers during their first year, and those who have incurred an undue number of accidents, however trivial, should when possible be transferred to safer occupations.

The accident rate (as distinct from the number of accidents) tends to vary directly with the number employed. The main factor is probably lessened exposure to risk resulting from the shorter hours worked during times of industrial depression. But another influence may be a tendency at such times to discharge the less steady workers, who are more prone to accidents than the others.

HEALTH IN INDUSTRY

Dr. J. C. Bridge contributes to the report a chapter on health. He says that, while undoubtedly industry does produce ill health, it is outside the factory that most of the ill health arises. "To work for a living in employment giving interest is a healthy occupation, but the monotony and the tedium of so many forms of modern industry make one wonder how it is carried on so zealously. Boredom must increase the significance attached to minor sickness and consequently the length of absenteeism." Dr. Bridge deprecates the tendency to employ workers under 18 the full limit of legal hours.

An innovation in safety work is the appointment in a factory which already possesses an active safety committee of carefully selected workmen in each department as "safety associates." Their duty is to bring to the notice of the safety committee any dangers or risk that otherwise might escape notice. In another factory the safety committee has organized a class of boys for instruction in safety principles and in first aid.

Indian Students in England

In Dr. Thomas Quayle's "Report on the Work of the Education Department of the Office of the High Commissioner for India" for the year ended last September has been published. The number of Indian students at the universities of the United States and on the European continent is estimated at 2,000, while the number in the British Isles is nearly ten times greater. There are about seventy Indian women students at British universities and colleges, medicine and education being their main subjects of study. The present report confirms the opinion expressed by Dr. Quayle in the last few years that there is a steady improvement in the standard of the Indian students who come to this country. The majority are on the whole well qualified to embark on the courses for which they have come. There have been many academic successes, and the athletic and other distinctions won by Indian students shows that they are taking an ever increasing part in the corporate and social life of the colleges. The large number engaged on postgraduate work reflect the fact that after taking good degrees at home universities they have come here to do advanced or research work for which the necessary facilities are not always available in India. An important change is that most of the students are training in various scientific and technical professions instead of largely confining themselves, as they did too often, to cultural and legal training.

Maternity and Child Welfare

Sir Kingsley Wood, minister of health, addressing the National Council on Maternity and Child Welfare, referred to maternal mortality as one of the most pressing public health problems. On the other hand, child welfare work showed steady and satisfactory progress. The high death rates of infants under 1 year, which prevailed up to the early part of this century, was a powerful factor in the institution of the child welfare movement. The result had been the remarkable and consistent reduction in those rates from 128 deaths under one year per thousand births a year in the first decade of this century to rates which in the last four years never exceeded 66 and in 1934 fell to the record figure of 59. A striking example of the results that could be obtained by early recognition and treatment was shown in orthopedic work. It had become increasingly clear that cripples were largely made and not born and that many of those congenital defects which did occur were comparatively slight at birth and could be best rectified in the earliest years. The results of improved methods was shown in the marked decline of the more serious crippling defects, and in particular of tuberculosis of the bones and joints.

The fact that maternal mortality showed no such decline was a matter of grave national concern. The problem was of great complexity. Maternal mortality occurred among the rich as well as the poor and in the high-class seaside town of Bournemouth was more than in industrial Sunderland, depressed by gross unemployment. The number of antepartum clinics had steadily increased and also the number of maternity beds provided by the local authorities. There was much to be said for an improvement in the midwifery service. The remuneration of midwives was low and this reacted on the quality of entrants to the profession and their efficiency. He was examining this question and would receive the views of various important associations and local authorities and would see what could be done.

"The Radium Hen"

An instrument to assist hospitals that have lost or mislaid radium needles has been invented in the National Physical Laboratory. It has been called "the radium hen," because it clucks like a hen when placed near radium, and the nearer it is the more rapidly and excitedly it clucks. It has been used to find a radium needle suspected of having been washed down a hospital sink. Water poured down the sink had been tested for radioactivity without result. Every trap in the waste pipe had been taken out and still there was no trace of the needle. Then the "radium hen" was tried and quickly led by its clucking to the point in the pipe at which the needle was lodged.

In appearance the instrument is not unlike a garden syringe, but behind its brass-cased head is a neon lamp and a trail of "flex" leading to a box of high tension electric batteries. The neon glows when the electric pressure is sufficient to cause a discharge through it. Here the pressure is adjusted so that the lamp will just not light. The radium radiation, as it were, pulls the trigger. The lamp has to be kept covered, as it is sensitive to daylight. It therefore cannot be used as an indicator. This is provided by the electric current, which flows

through the lamp when it is alight. This current is converted into sound either by the use of head phones or by a loud speaker, which clucks in correspondence to the flashing of the hidden lamp.

PARIS

(From Our Regular Correspondent)

June 21, 1935.

Law to Check Abuse of Public Hospital Service

One of the members of the French chamber of deputies has introduced a bill to prevent further admissions to the public (free) hospitals of those who are able to pay. During the last few years the public hospitals have been overcrowded. Many persons whose means permitted them to enter private hospitals have been admitted because they wished to be under the care of medical men who are chosen on a competitive basis and who represent the leaders of the profession. The public hospital authorities have admitted many who should have been cared for elsewhere because the hospital budgets were greatly reduced. The medical profession has protested in vain thus far; hence this law will prevent abuse of the privilege to enter free hospitals. A committee will be appointed in each department of France. A representative of the administration and two physicians will constitute the personnel of the committee. Only emergency cases and persons who are proved to be indigent or temporarily without resources will be admitted if this bill becomes a law. After investigation of the individual applicant, a card, valid for six months, will be issued to those who are eligible to enter the free hospitals. The deputy in presenting the bill stated that "everything possible must be done to lighten the burden of a profession that has suffered so intensely and yet has remained faithful to its ideal of helping suffering mankind."

Intravenous Injection of Charcoal

At the March 11 meeting of the Academy of Sciences, a report was made of the results obtained following the intravenous administration of a 2 per cent solution (suspension) of charcoal of animal or vegetable origin. Physiologic solution of sodium chloride was employed as the medium. A hyperleukocytosis is produced, which represents about the double of the normal leukocyte content of the blood. It begins several hours after the injection and reaches its maximum in from six to eight hours, lasting about twenty-four hours. Small daily doses have the same effect as one large initial dose. The smaller the particles, the more lasting the hyperleukocytosis. The favorable action of such injections in infections is due to the resultant hyperleukocytosis.

Sporadic Scurvy in an Adult

At the March 8 meeting of the Société médicale des hôpitaux of Paris an interesting case of sporadic scurvy was reported by Sézary and Joseph. A woman, aged 37, had shown symptoms of scurvy for the eight months preceding admission to the hospital. At the onset the chief signs were bleeding from the gums, pain during mastication, marked weakness and emaciation. Two months later a severe metrorrhagia lasting three weeks and large ecchymoses on the lower extremities were noted. There was also pain and swelling of the joints. The dyspnea on exertion and emaciation were the symptoms especially complained of, when the patient was first seen by the authors. The condition of the gums, the arthritis in the ankle joints and the purpura led to the suspicion of scurvy. The blood examination revealed a secondary anemia, and although the coagulation time was normal the clot formation was abnormal. Eighteen months prior to the onset of the gingivitis and other initial symptoms, the patient had an attack of urticaria and was told not to eat any fruit, vegetables or milk; thus all vitamin C had been eliminated from her diet.

In the discussion, J. Hallé reported two sporadic cases of scurvy in adults. In one of these an elderly man had followed a diet composed exclusively of macaroni and vegetable soup. Recovery rapidly followed a change of diet in which fresh fruits, vegetables and salads predominated. The second patient was also an elderly man, who had attempted to follow a diet composed of only soup made of bread.

Armand-Delille recalled the large number of cases of scurvy observed during the World War among retreating Serbian soldiers, who were obliged to live on jam and biscuits. Justin-Besançon called attention to the recent work of American investigators and recommended the use of cevitamic acid in the treatment of cases of scurvy.

The Schick Reaction in the French Army

In the January issue of the *Archives de médecine et de pharmacie militaires,* Fricker reports finding the reaction positive in 51 per cent of 7,800 soldiers. Among 212 noncommissioned men, whose average age was 28 years, the incidence of positives was 40.5 per cent and among seventy-six officers, whose average age was 37 years, it was 18.4 per cent. A preceding attack of diphtheria seems not to have any immunizing action. The proportion of positive Schick reactions in soldiers who had diphtheria in infancy was 47.3 per cent.

Indications for Periarterial Sympathectomy

Based on their experience of 546 operations, Leriche and Fontaine, at the March 25 meeting of the Academy of Sciences, reported the following as indications for periarterial sympathectomy. It is especially efficacious in the arteriosclerotic form of arteritis, when thrombosis is absent. In senile arteritis, it is a conservative procedure and may enable one to avoid an amputation.

In thrombo-angiitis, ganglionectomy and adrenalectomy are preferable to periarterial sympathectomy. In vasomotor disturbances of the Raynaud type the latter procedure in younger individuals gives excellent immediate and prolonged results. In scleroderma, periarterial sympathectomy is especially indicated when the lesions are recent and localized. The operation is followed by astonishingly good results in posttraumatic sequelae, such as hard edema and painful osteoporosis. In ulcerations of amputation stumps of trophic origin, periarterial sympathectomy is especially indicated. The same is true of leg ulcers, delayed union of fractures and the Volkmann syndrome (when there is no arterial thrombosis).

Cancer of Cervix Following Subtotal Hysterectomy

At the April 1 meeting of the Obstetric and Gynecologic Congress of Paris, Sejournet reported a case of cancer developing in the cervical stump five years after a subtotal hysterectomy for fibroids. He found 302 similar cases, which had been reported since 1926. The majority of these were not seen by surgeons but were recognized when the patients applied for radium treatment.

First Congress of Human and Animal Brucellosis

Representatives of the medical and veterinary schools gathered for the first time in Avignon, June 11, to discuss the relations between the different forms of brucella infections in man and those of animals. The subjects discussed were prophylaxis and treatment of undulant fever, differentiation of the various types of brucella infection, epidemiology of brucella infections in relation to the dairy industry, and legislation on the subject of undulant fever.

Admiral Grayson Elected President of League of Red Cross Societies

At a meeting in Paris at the headquarters of the League of Red Cross Societies, Admiral Cary T. Grayson was elected president, to succeed the late John Barton Payne. Admiral Grayson is eminently qualified to fill this position. He was the personal physician of Presidents Woodrow Wilson and Theodore Roosevelt. He is a commander of the French Legion of Honor.

Cancer Pamphlet for the Public

The league for the control of cancer has recently issued a pamphlet for distribution in every city and village of France, which can well serve as a model for similar organizations in other countries. The different forms of neoplasm are discussed in a way to make the general public grasp the manner in which cancer and sarcoma develop and spread. The necessity of early recognition is emphasized. Next follows the frequency of malignant growth in the world, the causes of cancer, and a discussion of precancerous conditions and the rôle of personal hygiene in prevention. The remainder of the pamphlet is devoted to a series of excellent photographs of patients with malignant superficial cancers and another series showing the appearance of the individuals following treatment. An outline of the latter is given, also a list of anticancer centers all over France and its colonies where those who wish to have an early diagnosis made can apply. The slogan "Cancer is curable" is stressed. The public is urged to take a more optimistic view of cancer, by a summary of the percentages of cures in various types of malignant disease if the diagnosis can be made before the lymphatics are involved.

BERLIN

(From Our Regular Correspondent)

May 27, 1935.

Inquiry into Garbage Removal in Berlin

Some time ago a number of workmen engaged in garbage removal complained to the consultation center of the university institute for research on occupational diseases of injuries to health that they thought they were suffering by reason of their employment. A medical inquiry into the conditions under which workmen engaged in garbage removal are obliged to work was instituted. A physician accompanied the garbage wagons on their rounds, in order to become acquainted at first hand with the nature of the work. All loading centers for garbage were inspected. It was found that these workmen are exposed to a health hazard, but no more than groups of workmen engaged in certain other lines of heavy outdoor work. To determine what injuries garbage workmen suffer, 700 were subjected to a medical examination. The workmen presented frequently skin disorders and skin changes, particularly papules and pustules. Comparatively few suffered from hernias, although many were subject to muscular rheumatism, owing to the fact that they were often exposed to inclement weather. Workmen who have been engaged for many years in this type of work show the harmful effects of the dust that rises from dry fine garbage, but no evidence of active tuberculosis could be discovered.

Anteflexion of the Uterus

Many anatomic inquiries have dealt with the question as to why the uterus lies anteflexed. Prof. M. Westenhöfer, anatomist of Berlin, has sought to solve the problem by the application of ontogenetic principles, as expounded before the Berliner Gesellschaft für Geburtshilfe und Gynäkologie. The position of the uterus in the pelvis is dependent on the relation of the pelvis to the spinal column. When man came to abandon the quadrupedal posture and assumed the erect position, only the lumbothoracic portions of the spine were erected, whereas the sacral portion, firmly united with the pelvis, diverged but slightly from its former horizontal position. Owing to that fact the uterus remained nearly horizontal; that is, anteflexed. The acetabulum lies vertically under the sacrum; in other words, the axis of the ilium forms with the sacrum an angle of nearly 90 degrees, whereas in other mammals the pelvis is shifted more or less caudad. Only in man can one speak of a pelvic arch. If one causes a four-footed mammal to stand erect, the whole pelvis, together with the axis of the sacrum and the contents of the pelvis, is involved in the process; all the parts lie then vertical to the horizontal line, including the uterus; there is no trace of anteflexion. Hence anteflexion does not depend on the assumption of the erect posture but, on the contrary, in man on the preservation of features of his former quadrupedal posture. Likewise the configuration of the external soft parts, particularly the buttocks, is associated with this fact, for it is evident that no animal has buttocks of a form similar to the human type.

Relation of Surgery and Orthopedics

The representatives of surgery and of orthopedics have held different opinions with regard to the recognition of orthopedics as a specialty, and these differences have led to many controversies at congresses. Now it has been agreed that orthopedics shall continue to be recognized in the medical curriculum and as a subject for examination, being considered as a branch subject of surgery, to which must be assigned the dominant position as one of the three principal branches of medicine. As the chairmen of the German Surgical Society and the German Orthopedic Society both admitted to be the case, no sharp differentiation of the fields of activity can be drawn. A rough division, however, may be based on the fact that to surgery belong chiefly those diseases in the treatment of which operative measures stand in the foreground. Hence restorative surgery and fresh injuries, including fractures and sprains, come mainly under the head of surgery, whereas orthopedics comprises principally those cases in the treatment of which bloodless interventions and the use of orthopedic apparatus are commonly preferred.

Defects in Color Vision

For years, Prof. William Trendelenburg, physiologist of Berlin, has been studying defects of color vision, to discover whether in a line of hereditary succession the type of the anomalies remains the same or whether they possibly may alternate with color blindness. In his research a distinction between the rested condition and the fatigued condition was strictly carried out. It was found that a changed reactivity (fatigue) was not an inherent part of the anomaly. Examinations of enzygotic twins revealed plainly that a congenital peculiarity lay at the basis of the changed reactivity also. The various forms of defects in color vision, it was found, do not merge together in a hereditary line; that is particularly true of anomalies in anopia of the same type. If there is a simultaneous occurrence of different forms in the same family, it is evident that there is not a uniform hereditary succession but that a second hereditary predisposition is making itself manifest. These results are in harmony with the theory of Waaler to the effect that a particular hereditary predisposition lies at the basis of each of the four types of defective color vision. For the changed reactivity, however, a special hereditary predisposition may probably be assumed. These results furnish support to the Helmholtz theories of color vision.

Congress on the Circulation of the Blood

The Gesellschaft für Kreislaufforschung held recently in Wiesbaden a joint session with the Deutsche Gesellschaft für Innere Medizin. The opening paper on the main topic, "Circulation and Respiration," was presented by W. R. Hess, physiologist of Zurich. Next in order, K. F. Wenckebach of Vienna discussed the clinical relations of respiration to the circulation. He emphasized particularly the importance of diaphragmatic respiration, on which the thoracic respiration is based. In addition to the costal muscles and the diaphragm, the long back muscles (as costal spreaders) exert an essential influence on respiration. Hochrein of Leipzig called attention to the pulmonary circulation.

The second day was spent in joint session with the Deutsche Gesellschaft für Innere Medizin, and the papers presented on aeronautic problems have already been discussed in a previous letter (THE JOURNAL, June 22, page 2279).

MADRID

(From Our Regular Correspondent)

June 1, 1935.

Synthesis of Cyclic Compounds

Dr. José Giral y Pereira, professor of biologic chemistry at the Faculty of Medicine of Madrid, was recently appointed an academician at the Academia Nacional de Medicina. In his speech of entrance to the society, he discussed the ability of animals to synthesize cyclic compounds. He said that the opinion that animals are unable to synthesize cyclic compounds, because of their inability to build the benzene ring, can be maintained no longer. It has been proved that animals synthesize cholesterol, in spite of the fact that they are unable to synthesize tryptophan, lysine, arginine and cystine; that is, certain amino acids, either cyclic or acyclic. The stability of rings and nuclei depends on the number of atoms in their chains as well as on the presence of antagonistic functional groups of atoms at the ends of an open chain. Protozoa develop normally in a medium which contains only an ammonium salt and carbohydrates, from which compounds they build the cyclic compounds which form the amino acids. The speaker believes that there are specific diastases for the formation of cyclic compounds. The speaker discussed the mechanism of formation of biliary acids from cholesterol. Diseases caused by a retention of cholesterol are the sequels of faulty oxidation.

The speaker discussed also the molecular structure of certain compounds in relation to their activity as carcinogenic substances. He said that the nonhydrogenized benzene compounds of five nuclei are the only types frankly active as carcinogenic agents among the group of coal tar derivatives, especially benzopyrine. Cook says that there is a close relation between sterols, biliary acids, sex hormones and carcinogenic substances and that the latter have their origin, in living organisms, in the transformation of hydro-aromatic semisaturated cycles of either sterols, biliary acids or sex hormones, into aromatic nuclei with double bonds. The phenanthrene nucleus in the compound is responsible for the transformation of a physiologic into a pathologic action. Other cyclic bodies built by animals are inosite, several aromatic substances, vitamin A, flavine bases, uric acid and pyridine bases. Birds have the property of synthesizing and eliminating uric acid. Their eggs are poor in purine, but the organism of the birds contains it in abundance. Kellmann of Vienna, the first to report on the possibility of the synthesis of cyclic bodies by man, reported the case of a girl who, while receiving a diet without purines, showed an increase of 4 Kg. in weight in fifty days and eliminated during this time 15 Gm. of uric acid, probably synthesized by the organism.

Obdulio Fernandez, professor of chemical analysis in the Faculty of Pharmacy of Madrid, discussed the paper of Dr. Giral y Pereira. He said that Dr. Pictet spent eight years trying to find a reducing agent for hydrogenization of one of the nuclei of nicotine. He found that although both nuclei of nicotine are inert one is more inert than the other. That seems to indicate that the reduction of cyclic compounds is a mechanism of defense of living organisms. The closure of a molecule of dextrose into a molecule of inosite does not require as great an expenditure of energy as that required to burn the whole chain in the molecule of dextrose. In comparing the elimination of indole with that of other aliphatic substances it can be noted that the elimination of aromatic substances is easier and requires the expenditure of less energy than that of compounds of a closed chain. To state that animals transform only compounds synthesized by plants accuses man of a kind of parasitism that really does not exist. With present knowledge it would seem foolish to seek alkaloids in animals. And yet their presence in animals has been verified in the field of forensic chemistry.

History of Ferran's Vaccines

Dr. Garcia del Real, professor of the history of medicine at the Faculty of Medicine of Madrid, recently lectured before the Academia Nacional de Medicina of Madrid on the history of Ferran's vaccines. During the cholera epidemic in Spain in 1885 Dr. Ferran, who was the municipal physician of Tortosa, came to Madrid and called the attention of the medical profession to the harmlessness and immunizing properties of a vaccine that he had prepared with living Vibrio cholerae and the results of which he had already verified, first by experiments and then by immunizing himself, his family and many other persons. Several injections were necessary to develop immunity and Dr. Ferran performed about 50,000 vaccinations during the epidemic. The vaccine did not control the development of cholera when given to persons who were in the prodromal stage, but it produced complete immunity in persons free of the disease. Some physicians, especially Drs. Gimeno and Pulido, believed in Ferran's theories but others attacked them to such an extent that the government ordered Ferran to stop his crusade for the prevention of cholera. The number of deaths (160,000) caused by the epidemic would have been greatly reduced if the vaccination campaign had been continued. Two years later, during an epidemic of typhoid, Ferran prepared a vaccine that produced immunity. He also prepared vaccines against plague and tuberculosis. The speaker said that Ferran, like Gutiérrez of Buenos Aires and Semmelweiss, was misunderstood by his colleagues. Ferran, Servetus, Gimbernat and Cajal have been the four most prominent Spanish scientists.

Homage to Dr. Gimeno

Pupils and friends of Dr. Amalio Gimeno, president of the Academia Nacional de Medicina of Madrid, collaborated in organizing a sumptuous celebration at the Academia Nacional de Medicina, May 31, in honor of his eighty-fifth birthday. The most prominent Spanish scientists and a select group of other notables attended. Dr. Gimeno, wearing the medal of the Spanish Legion of Honor, presided. Dr. Goyanes, ex-president of the Liga española contra el cancer, made the speech of welcome. Dr. Simonona read from the works of Dr. Gimeno, who was presented during the ceremonies with a gold medal and with the first edition of a book containing his scientific and literary productions. Dr. Gimeno was the minister of state during the World War and professor of medicine in the Faculties of Medicine of Santiago, Valladolid, Valencia and Madrid. He is a well known orator and writer on medical, political and socialist topics. His replies to speeches made in his honor were touching, as he is almost blind because of cataract. And yet he still is engaged in scientific work.

Marriages

ROBERT E. SHOEMAKER, Haddonfield, N. J., to Miss Eleanor Fairlie of Norristown, Pa., April 15, 1933, announced, June 18.

ALBERT LOUIS GUSTETTER, Nogales, Ariz., to Mrs. Rose Sylvia of Hollywood, Calif., in Phoenix, Ariz., April 24.

EDWIN MONROE GRISWOLD, Granby, Conn., to Miss Eleanor Forbes Hodge of South Glastonbury, April 30.

ALLEN RICHARD MORRISON, Maywood, Ill., to Miss Evelyn Marie Herbst at Chicago Heights, July 6.

NAPIER S. ALDRICH, Coldwater, Mich., to Miss Virginia Hague of Columbus, Ohio, June 15.

WALTER M. PFEIFFER to Miss Gertrude F. Martin, both of Quebec, Que., Canada, June 3.

WILLIAM M. COLLINS to Miss Rosa J. Connolly, both of Lowell, Mass., recently.

RALPH F. ALLEN, Milton, Fla., to Miss Eugenia Dillon of Miami, Fla., June 17.

Deaths

Cornelius John Tyson ✠ New York; University and Bellevue Hospital Medical College, New York, 1912; clinical professor of medicine at his alma mater; served during the World War; aged 51; consulting physician to the French Hospital, New York, Southside Hospital, Bayshore, and the Brunswick General Hospital, Amityville; president of the medical board and director of the medical division of St. Vincent's Hospital, where he died, June 28.

William Dunn Gates ✠ Indiana, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1898; past president of the Indiana County Medical Society; fellow of the American College of Surgeons; served during the World War; at one time county coroner; on the staff of the Indiana Hospital; aged 69; died, June 25, of internal traumatic hemorrhage.

Thomas P. Keenan, Lake Geneva, Wis.; Chicago College of Medicine and Surgery, 1916; member of the State Medical Society of Wisconsin; president and formerly secretary of the Walworth County Medical Society; served during the World War; city health officer; aged 42; died, June 15, in the Walworth County Hospital, Elkhorn, of pneumonia.

Elliott Knight Dixon, St. Louis; Washington University School of Medicine, St. Louis, 1915; member of the Missouri State Medical Association and fellow of the American College of Surgeons; served during the World War; aged 44; on the staffs of the Jewish Hospital and St. Luke's Hospital, where he died, June 25, of pneumonia.

Carlton S. L. McCullough, Steubenville, Ohio; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1923; member of the Ohio State Medical Association and the West Virginia State Medical Association; served during the World War; aged 41; died suddenly, June 18, of coronary thrombosis.

Albert De Kalb Parrott, Kinston, N. C.; University College of Medicine, Richmond, 1906; member of the Medical Society of the State of North Carolina; fellow of the American College of Surgeons; on the staff of the Parrott Memorial Hospital; aged 52; died, April 19, of chronic myocarditis.

Wilford Alexander Norris, Columbia, Mo.; University of Missouri School of Medicine, Columbia, 1883; member of the Missouri State Medical Association; for eighteen years city health officer; on the staff of the Boone County Hospital; aged 77; died, May 28, of coronary thrombosis.

Martin Yates, Fulton, Mo.; Bellevue Hospital Medical College, New York, 1876; member of the Missouri State Medical Association; past president and secretary of the Callaway County Medical Society; member of the board of education; aged 83; died, April 9, of arteriosclerosis.

Vladimir Dmitrievich Sezenevsky, Honolulu, Hawaii; Military Medical Academy, St. Petersburg, Russia, 1893; member of the Hawaii Territorial Medical Association; on the staff of the Leahi Home; aged 66; died, May 2, of a liver abscess, while on a train near Sparta, Wis.

Dempsey L. Travis, Lakewood, Ohio; University of Wooster Medical Department, Cleveland, 1878; member of the Ohio State Medical Association; medical officer of the public safety department of Cleveland; aged 80; died, June 30, of chronic myocarditis and arteriosclerosis.

Milton S. Smith, La Porte, Ind.; Chicago Homeopathic Medical College, 1896; member of the Indiana State Medical Association; on the staff of the Holy Family Hospital; aged 73; died, July 3, in the Presbyterian Hospital, Chicago, following an operation on the prostate.

Franklin Sawyer Palmer, Seattle; Harvard University Medical School, Boston, 1890; member of the Washington State Medical Association; formerly health officer and police surgeon; aged 69; died, June 5, in the Providence Hospital, of valvular heart disease.

Earle Raymond Van Cott, Salt Lake City, Utah; Rush Medical College, Chicago, 1914; member of the Pacific Coast Oto-Ophthalmological Society; served during the World War; aged 46; died, May 14, of angina pectoris.

Walter Cyril Steele, Niagara Falls, N. Y.; University of Buffalo School of Medicine, 1912; member of the Medical Society of the State of New York; aged 44; died, May 12, of intestinal fistula and pulmonary embolism.

James Baruch Hughey, Kingstree, S. C.; University of Maryland School of Medicine, Baltimore, 1883; member of the South Carolina Medical Association; aged 73; died suddenly, June 13, of endocarditis.

John Wallis Walker, Winona, W. Va.; University of Louisville (Ky.) Medical Department, 1893; member of the West Virginia State Medical Association; aged 78; died recently of cerebral hemorrhage.

William Harvey Dixon, Ayden, N. C.; Medical College of Virginia, Richmond, 1901; member of the Medical Society of the State of North Carolina; aged 62; died, May 29, of angina pectoris.

Eugene Elmer Kendall, Waterford, Pa.; Jefferson Medical College of Philadelphia, 1887; member of the Medical Society of the State of Pennsylvania; aged 74; died, June 11, of heart disease.

James Tompkins Leftwich ✠ Highland Springs, Va.; Medical College of Virginia, Richmond, 1915; president of the county board of health; aged 51; died suddenly, June 6, of angina pectoris.

Elmer Gilman Fosgate, Ashburnham, Mass.; Dartmouth Medical School, Hanover, N. H., 1889; member of the Massachusetts Medical Society; aged 75; died, June 8, of valvular heart disease.

John Isaac Miller, Gary, Ind.; Illinois Medical College, Chicago, 1908; formerly a member of the state legislature in Wyoming; aged 57; died, June 13, of chronic myocarditis and endocarditis.

Herbert Erwin Phelps ✠ Carthage, N. Y.; Long Island College Hospital, Brooklyn, 1896; aged 63; died, June 11, in the House of the Good Samaritan, Watertown, of cerebral embolism.

Georgia Sizer Orvis, Guthrie, Okla.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1900; aged 86; died, May 13, in the Masonic Home for Aged, of chronic myocarditis.

Charles L. Dohm, Chisago City, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1896; aged 60; died, May 28, in St. Paul, of rheumatic heart disease.

John A. Rader ✠ Caney, Kan.; Eclectic Medical Institute, Cincinnati, 1890; past president of the Washington County Medical Society; aged 75; died, June 6, of arteriosclerosis.

William Henry Parrish, Vallejo, Calif.; Willamette University Medical Department, Salem, 1889; aged 87; died, May 18, of cerebral hemorrhage and bronchopneumonia.

David F. Haagen, York, Pa.; Jefferson Medical College of Philadelphia, 1908; aged 51; died, May 11, in St. Peter's Hospital, New Brunswick, of lobar pneumonia.

William Kelley Sanborn, Oakland, Calif.; University of California Medical Department, San Francisco, 1893; aged 69; died, May 24, of chronic myocarditis.

William J. Waits, Gray, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1895; aged 66; died, April 18, of diabetes mellitus and hypertension.

Jacob De Witt Graham, Springville, Iowa; Rush Medical College, Chicago, 1891; aged 76; died, June 19, of cardiorenal sclerosis and cerebral hemorrhage.

Clarence Williamson Orr, Cincinnati; Miami Medical College, Cincinnati, 1883; aged 79; died, June 10, of chronic nephritis and auricular fibrillation.

James Phillippe Tamiesie, Portland, Ore.; University of Oregon Medical School, Portland, 1889; aged 73; died, April 29, of coronary thrombosis.

Franklin Thomason Beatty, Boston; Jefferson Medical College of Philadelphia, 1885; aged 77; died, April 18, of chronic myocarditis.

Benjamin F. Owens, Louisville, Ky.; Jefferson Medical College of Philadelphia, 1866; aged 92; died, May 17, of cerebral hemorrhage.

John E. Thomas, Baltimore; Temple University School of Medicine, Philadelphia, 1912; aged 70; died, April 18, of cerebral hemorrhage.

Jacob W. Arbegast, Bellefontaine, Ohio; Eclectic Medical Institute, Cincinnati, 1894; aged 78; was found dead, June 17, of heart disease.

Walter Pollano ✠ Lawrence, Mass.; Middlesex College of Medicine and Surgery, Cambridge, 1922; aged 56; died, June 25.

Thomas J. Russell, Perry, Iowa; Missouri Medical College, St. Louis, 1893; aged 73; died, May 1, of cerebral hemorrhage.

Arthur S. Austin ✠ Aberdeen, Wash.; Detroit College of Medicine, 1886; aged 72; died, May 11, of angina pectoris.

CORRECTION

Report of Death.—Dr. William A. Anderson of Glencoe, Ala., was erroneously reported dead in THE JOURNAL, July 20, page 217. Dr. Anderson is alive and in good health.

Bureau of Investigation

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE: The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding and (6) the date of issuance of the Notice of Judgment—which may be considerably later than the date of the seizure of the product.]

Mineral Wells Crystals.—W. E. Haist, Chicago. Composition: Essentially Glauber's salt, with small quantities of magnesium, calcium and iron carbonates and chlorides. For rheumatism, indigestion, kidney, liver, skin and blood disorders, etc. Fraudulent therapeutic claims.—[*N. J. 21810; September, 1934.*]

Heal-Kwik Plaster.—Andrew J. Pontier, Clinton, N. J. Composition: Essentially a plaster containing rosin, wax and starch. For boils, sores, inflammation, sore throat, swollen glands, etc. Fraudulent therapeutic claims.—[*N. J. 21814; September, 1934.*]

Jacob Becker's Celebrated Eye Balsam.—W. M. Olliffe, Inc., New York, and Kells Co., Newburgh, N. Y. Composition: Essentially mercury and finely powdered sand, incorporated in fat. Fraudulent therapeutic claims.—[*N. J. 21818; September, 1934.*]

Begy's Mustarine.—S. C. Wells & Co., Le Roy, N. Y., and Mutual Drug Co., Cleveland. Composition: Essentially an ointment of petrolatum, containing volatile oils including those of turpentine, sassafras, cajeput and wintergreen, and red pepper, with a small amount of ground mustard. For sore throat, chest colds, lame back, stiff joints or muscles, rheumatism, etc. Fraudulent therapeutic claims.—[*N. J. 21819; September, 1934.*]

G. O. Remedy.—A. J. Holden, Rawlins, Wyo. Composition: Essentially plant drug extracts, salicylic acid and water. For hay fever, itch, eczema, psoriasis, etc. Fraudulent therapeutic claims.—[*N. J. 21821; September, 1934.*]

Acnoid No. 1 and Acnoid Special No. 2.—Sargeant Acnoid Pharmaceutical Co., Inc., East Orange, N. J. Composition: No. 1, essentially salicylic acid and small amounts of salol and camphor in a fatty acid and petrolatum base; No. 2, essentially salicylic acid, zinc stearate and small amounts of salol and camphor in a fatty acid and petrolatum base. For skin diseases, etc. Fraudulent therapeutic claims.—[*N. J. 21822; September, 1934.*]

Novonol Ointment.—Belmont Co., Springfield, Mass. Composition: A local anesthetic such as procaine hydrochloride, in a mixture of fatty acids and petrolatum. Adulterated because below professed strength and purity, and misbranded because of false and misleading claims to being "antiseptic."—[*N. J. 21976; September, 1934.*]

Belmont Germicide.—Belmont Co., Springfield, Mass. Composition: Essentially common salt, borax, camphor, menthol and a small amount of wintergreen. For wounds, ulcerating corns, bunions, infections, etc., Fraudulent therapeutic claims.—[*N. J. 21976; September, 1934.*]

Lambert's Syrup.—Dr. J. O. Lambert, Ltd., Troy, N. Y. Composition: Essentially chloroform (0.91 minim per fluid ounce), creosote, volatile oils including sassafras, menthol and wintergreen, epsom salt (2.4 per cent) and a small amount of a benzoate, with sugar and water. Misbranded because chloroform content falsely declared, and because of fraudulent therapeutic claims as a remedy for coughs, catarrh, bronchitis, asthma, etc.—[*N. J. 21979; September, 1934.*]

Fo-Sen.—Ellis-Jones Drug Co., Memphis, Tenn. Composition: Essentially plant drug extracts including a laxative with alcohol, sugar and water. For liver trouble, nervous and sick headache, indigestion, etc. Fraudulent therapeutic claims.—[*N. J. 21980; September, 1934.*]

Wallace's Liverade.—Liverade Medicine Co., Fulton, Ky. Composition: Essentially plant drug extracts including a laxative, such as cascara sagrada, with licorice, red pepper, sugar, alcohol (9.1 per cent by volume) and water. For indigestion, sick headache, fevers, chronic constipation, piles, etc. Fraudulent therapeutic claims.—[*N. J. 21980; September, 1934.*]

Jayne's Brio-da Tonic Pills.—Dr. D. Jayne & Son., Inc., Philadelphia. Composition: Essentially an iron powder, with calcium and magnesium glycerophosphates, copper sulphate and plant drug extracts, including red pepper and nux vomica. For anemia, debility, loss of appetite, etc. Fraudulent therapeutic claims.—[*N. J. 21981; September, 1934.*]

Gep Quai Yok Due.—Louie Chong Dai Chinese Herb Co., San Francisco. Composition: Essentially a small amount of plant or animal material, with alcohol (29.5 per cent by volume), sugar and water. Misbranded because alcohol content was greater than declared on label, and because of the fraudulent representation that the stuff was a remedy for rheumatism.—[*N. J. 21982; September, 1934.*]

Khylex.—Khylex Chemical Co., Alexandria, Va. Composition: Essentially sodium hypochlorite, sodium hydroxide, sodium carbonate, common salt and water. For skin eruption, etc. Fraudulent therapeutic claims.—[*N. J. 22021; September, 1934.*]

L. B. J. Cough Syrup.—Little Brown Jug, Inc., Sinking Spring, Pa. Composition: Essentially plant drug extracts, including wild cherry, tar, sugar, alcohol and water. For coughs, croup, whooping cough, bronchitis, etc. Fraudulent therapeutic claims.—[*N. J. 22022; September, 1934.*]

Correspondence

MOTORING AND SCIATICA

To the Editor:—The following aids are helpful for automobile drivers with sciatic neuritis: 1. A snug fitting elastic stocking for the thigh. 2. A rubber sponge fastened to the floor of the car with a piece of leather for the heel of the right foot to rest on, or a small rubber invalid's cushion for the left foot. 3. Have car springs oiled every month.

A. T. BLACHLY, M.D., Portland, Ore.

GYNECOMASTIA DURING HYPERTHYROIDISM

To the Editor:—I have just read Dr. Starr's article "Gynecomastia During Hyperthyroidism" in THE JOURNAL, June 1, page 1988, and noted the rareness with which this condition has been observed. It may be of interest that I have recently observed a case of bilateral, symmetrical hypertrophy of the mammary glands in a man, aged 35, with classic exophthalmic goiter, the hypertrophy of the glands having been noticed for two months, while the subjective symptoms of hyperthyroidism had been noticed for nine months. Following operative treatment for the goiter, along with improvement of his other symptoms, the enlargement of the mammary glands receded to normal.

D. L. CURB, M.D., Galveston, Texas,

AUSCULTATION OF ABDOMEN

To the Editor:—In the article by Wakefield, Mayo and Bargen entitled "Ileus Associated With Transient Renal Insufficiency: A True Enterorenal Syndrome" (THE JOURNAL, June 22, p. 2235) there appears to be no mention of stethoscopic examination and sounds heard over the abdomen in any one of the ten cases reported. It is very likely that such an examination was performed in each case for audible peristaltic sounds and was very likely absent in all, so that it was omitted in the report. The importance of listening for peristaltic sounds in the differential diagnosis of paralytic and mechanical ileus was deeply impressed on me by Dr. Roger T. Vaughan at the Cook County Hospital whenever the problem presented itself. Especially is this of value when the patient has had one or more previous abdominal operations. Dr. Vaughan insisted, and probably still does, that one listen with the stethoscope over each abdominal quadrant for at least three minutes in all suspected cases of ileus in an attempt to determine whether the ileus is paralytic or mechanical, nonsurgical or operative. In almost all cases of nonmechanical ileus, one type of which is described by Wakefield and his associates in the article, no peristaltic sounds are audible. In mechanical ileus, especially if seen within the first twenty-four hours and particularly so in the first twelve hours of the obstruction, the peristaltic sounds are intensified up to the point of the obstruction and from there on disappear completely. Mechanical tinkling is diagnostic of complete mechanical ileus. The point which I wish to emphasize is that, in examination of acute conditions of the abdomen, auscultation to determine the presence or absence of peristaltic sounds and their character, if audible, should be performed and become a routine part in all case records of such nature.

NATHAN FLAXMAN, M.D., Chicago.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

BRONCHIAL ASTHMA IN CHILD

To the Editor:—My son, aged 4 years, has bronchial asthma. The father has sinusitis and bronchial asthma, which has been largely overcome in the climate of Arizona together with conservative nasal surgery. The mother is living and well but her sister has hay fever of the perennial type. The grandfather on the father's side has had bronchial asthma and hay fever for practically his entire life. The family history otherwise is essentially negative regarding allergy. The birth of the patient was normal, and his weight at birth was 10 pounds (4.5 Kg.). During the first six or eight weeks of life there was definite pylorospasm associated with projectile vomiting, controlled with atropine and postural feedings. The child had enteritis at 3½ years, with uneventful recovery. For the past two years the patient has had, coincident with occasional attacks of bronchitis, a definite asthma, which lasts from twenty-four to forty-eight hours and ceases with improvement in the bronchitis. During the past twenty-four hours he has had an attack of bronchial asthma without the usual coincident acute bronchitis to usher it in. There seems to be nothing of particular note in his physical examination except probable adenoid hypertrophy, as evidenced by a slight tendency to mouth breathing at night. His tonsils are essentially normal, with no history of tonsillitis. Roentgen examination of the chest is negative for thymic enlargement. I would appreciate discussion of a conservative approach to this case. I am particularly interested in the value of high voltage roentgen therapy over the tracheobronchial lymph nodes as an adjunct to conservative surgery of the pharynx. Please omit name.

M.D., Arizona.

ANSWER.—The facts stated describe typical bronchial asthma as it occurs in children: the antecedent history of allergy in the father, grandfather and aunt; the history of pylorospasm and enteritis; then the attacks of bronchitis, so often mislabeled asthmatic bronchitis, which finally turned into frank bronchial asthma. Too often these symptoms in children are diagnosed as bronchitis and asthmatic bronchitis and are merely treated symptomatically and no effort is made to find the cause of the trouble.

The attacks become more and more severe, the bronchitic element less and less, and the asthmatic symptoms become more and more striking until finally the family and the doctor realize that they are dealing with a case of bronchial asthma, which, in truth, was bronchial asthma from the beginning and should have been so recognized.

The experience of those specializing in the treatment of bronchial asthma and other allergic diseases has shown that in these children the best method of treatment is to find and then eliminate the cause or causes as completely as possible. Furthermore, in cases in which elimination of the cause has not been possible, desensitization to the cause has given excellent results in the hands of most allergists.

The procedure, then, is to have the boy "gone over" thoroughly from the allergic standpoint. The history should be searched carefully for etiologic factors, such as food, feathers, house dust and weeds. Complete skin tests should be carried out for pollens, epidermal substances, such as hair, dander and feathers; for all foods containing protein that the boy has eaten and for miscellaneous substances such as orris root, cottonseed, flaxseed and house dust.

After this procedure, elimination of the positive factors should be carried out thoroughly and desensitization should be done where indicated. Any other method of treatment, while helpful, does not begin to give the successful results that may be obtained in most cases by adhering to the usual allergic procedures. It is true, however, that attention must be paid to the general hygiene, especially the teeth and tonsils; but removal of tonsils and adenoids should be carried out only if indicated for pathologic changes in the tonsils and adenoids or because they harbor foci of infection. Operative procedures on the tonsils and adenoids or on the nose rarely give more than temporary relief in cases of bronchial asthma. Likewise, high voltage roentgen therapy over the tracheobronchial lymph nodes is not especially indicated, although it is true that a measure of relief is obtained in some cases.

It is important to have the child tested out thoroughly and promptly. In this way it is usually possible to avoid emphysema and pigeon-breast, which too often occur in these asthmatic children.

COLON SPASM AND MUCOUS COLITIS

To the Editor:—I have at present a man under my care, aged 38, single, who gives a history of having had influenza in 1918, and since then, he states, he has not had a natural bowel movement. He has had to resort to colonic irrigations for the last nine years in order to obtain relief. Numerous roentgen examinations, complete blood chemistry and gastro-intestinal series have been done in four of the largest hospitals in New York, all of which were negative, as far as the findings of any pathologic changes was concerned. In fact, the physical examination with the exception of the chief complaint shows no signs of abnormality. The patient is well nourished and is able to go about his work daily. There are no abdominal signs present. He appears to be very nervous and talks much about his condition. A tentative diagnosis of paralytic ileus, possibly neurotic in type, has been my contention. I have tried pituitary injections, diathermy, strychnine and many other therapeutic measures to build up his resistance and nervous system but without results. There is a definite mucous colitis present with reverse peristalsis and some spasticity. I note that Osler describes similar cases as ileus hystericus. The patient has seen many physicians during this long time without relief. Can you give me any idea as to what the real condition is and what therapeutic measures should be instituted if any? Is surgery advisable.

M.D., New York.

ANSWER.—The description of the case suggests a tendency to colon spasm and mucous colitis. While this condition may in some cases be largely a neurosis, it is by no means merely psychic in nature. It is more likely to be a neurosis of the vegetative nervous system. It is sometimes maintained by reflex irritation from the generative organs, most especially in the female. It may be an expression of allergy. It is in a large proportion of cases accompanied by a tendency to stasis in the proximal colon. In any case, no matter how the spasm originates it tends to produce a vicious circle of stasis in the proximal colon with spasm in the distal colon, a condition that might be termed "stasis spasm" because it is self perpetuating, the spasm leading to stasis and the stasis—making the colon contents more irritating—leading to spasm. The therapy should include the determination and elimination of the cause, if this is possible. It needs unlocking the spasm, which is often best done by oil enemas taken at bedtime for several successive evenings. It needs lessening the irritative quality of the stools by softening them with liquid petrolatum or in obstinate cases by the use of castor oil. The diet needs to be of the "smooth" type; i. e., as free from mechanically irritating particles as possible. As this diet is essentially constipating and as such a diet may maintain the stasis spasm, it is necessary for the patient to make persistent efforts to change the diet to a more or less "high residue" type as soon as or whenever his condition shows evidence of improving. Sedatives rather than stimulants for the central nervous system are likely to be of advantage, such as the administration of bromide. Antispasmodics of the type of atropine are likely to be of advantage to relieve acutely painful paroxysms, and this may be well combined with analgesics, such as acetylsalicylic acid and phenobarbital. Surgery is not advisable unless a definite malformation, correctable by it, is discovered.

TREATMENT OF AMEBIASIS-ECHINACEA

To the Editor:—Will you kindly inform me on the subject of the treatment of Amoeba histolytica and Giardia? A patient, who for five consecutive years has been under the continuous treatment of several physicians, has still a positive stool test and marked clinical symptoms. The treatment consisted of repeated courses of carbarsone, vioform, chiniofon by mouth and enema, emetine, neoarsphenamine, iodoxyquinolin-sulphonic acid, mercurochrome and iodine retention enemas. A druggist recommends Lloyd's Echinacea. What kind of drug is this? Is it specific? What are the Lloyd preparations? Please omit name.

M.D., California.

ANSWER.—A case of amebiasis persisting for five years under such treatment as mentioned suggests first a serious question as to whether one is dealing with Endamoeba histolytica at all. This matter should be verified by authoritative examination. The next step would be a detailed roentgen study of the large intestine and sigmoidoscopic examination to determine the nature, location and extent of any lesions present. If Endamoeba histolytica is proved present, the treatment recommended would be a course of carbarsone, 0.25 Gm. twice a day for one week, followed after one week by six retention enemas on alternate nights, each consisting of 200 cc. of 1 per cent carbarsone in 2 per cent sodium bicarbonate solution, introduced slowly and retained over night. This retention enema should be preceded by a cleansing soda enema two hours earlier. Again, after a ten day interval, a course of vioform 0.5 Gm. twice a day for ten days should be given by mouth. Persistence of Endamoeba histolytica after this treatment would suggest strongly the need of surgical attention to some deep focus.

So-called specific medicines are prepared by Lloyd Brothers, Pharmacists, Inc., Cincinnati. Echinacea is described as a liquid preparation made from the dried root of Echinacea augustifolia, the purple cone flower of our Western prairies, in unstated dilution in 65 per cent alcohol. According to John Uri Lloyd, Echinacea was used by the American Indians and taken up by the early settlers in the West under the name "Indian Head Root." Based on this use it was exploited first as a secret remedy ("Meyer's Blood-Purifier") and then as a proprietary panacea. C. G. Lloyd (1885) determined its botanic place, and the eclectic professors King, Goss, Webster, Ellingwood and Felter studied its clinical applications. The root contains resins and no alkaloids, according to Heyl and Staley, 1914. Several proprietary preparations of it have been praised for sialagogue, diaphoretic, antiseptic, stimulant and general alterative effects, but no good evidence of its value has been published and the claims appear to be extravagant. The drug was disapproved by the Council on Pharmacy and Chemistry in 1909. Among medical men in general, echinacea remains without use or repute.

References:

Sollmann, Torald: A Manual of Pharmacology, ed. 4, Philadelphia, W. B. Saunders Company, 1932, p. 204.
Solis-Colen, Solomon, and Githens, T. S.: Pharmacotherapeutics, New York, D. Appleton & Co., 1928.

DERMOGRAPHISM

To the Editor:—A man, aged 30, weighing about 190 pounds (86 Kg.) and standing 5 feet 10 inches (178 cm.) tall, and apparently in perfect health, came to me recently complaining of severe dermatographia. His past history relates only his having the usual childhood diseases, and when about 10 years old he suffered from what he was told was severe pyelitis of both kidneys. He made an uneventful recovery from this and has never been troubled since. He has had fairly severe attacks of acute arthritis and had all his upper teeth removed about five years ago with no return of his arthritis. At present he is in excellent health and works hard daily without any complaints, except suffering from this dermatographia. The physical examination reveals nothing pathologic. I have seen the patient scratch himself anywhere on the arm, legs and face (his hands, body and feet are immune from this) and immediately raise large red welts. This particularly bothers him while shaving, his face becoming streaked red and burning just after a shave. He must shave always at night and then retire. The condition will persist for two or three hours and then disappear entirely. Can you suggest what the cause of this might be and what I might do for him?

JOHN F. MAURER, M.D., Acosta, Pa.

ANSWER.—Dermographism is caused by a sensitization of the skin to stroking. Other forms of trauma cause less reaction. The work of Ebbecke, Lewis and Grant, Gildemeista and Scheffler, Torok, Lehner and Urban has shown that the trauma releases an irritating substance in the skin, which causes a localized transient edema, a wheal. This resembles the wheal of urticaria except that it often does not itch.

The name urticaria factitia given to this condition is a misnomer, for it is evidently an entirely different condition. Many patients with urticaria have no dermographism and, on the other hand, most sufferers from dermographism have no urticaria.

Dermographism is often associated with mental disorders, epilepsy, idiocy, insanity or catatonia. It is seen also in cases of toxemia, lead poisoning and alcoholism. It is more marked after physical or emotional strain and in women at the menstrual periods. Many cases of dermographism, however, like the one described, show no other abnormality. It has been suggested that excessive histamine production in the intestine may be responsible in some of these cases. Endocrine imbalance is an important factor in some cases.

If the cause can be discovered, indications for therapy are plain; but in many cases this is impossible. General hygiene is of course the first indication. If no cause can be discovered, reduction of intestinal histamine may be attempted by implantation of Bacillus acidophilus. For temporary relief, cold applications are most effective, according to Reznick (Klinische Studieren ueber Dermographism, *Wien. Klin. Wchnschr.*, Oct. 29, 1914, p. 1424). Epinephrine and therefore probably ephedrine are less effective. The effect of cold can be counteracted, however, by heat, which, applied within a certain time, brings back the wheals. In the case under discussion, therefore, cold should be maintained for some time. Possibly the use of ephedrine before shaving and the application of cold afterward may have a better effect.

The patient can be thankful that he did not live during the days of the witchcraft hysteria. If at that time it was discovered that the word Satan could be written on a person's skin and would remain there (dermographism), the condition was apt to be cured promptly by the application of heat; that is, by the person's being burned alive.

TREATMENT OF SYPHILIS

To the Editor:—Wassermann-fast acquired syphilis was discovered incidentally in a white man, aged 30, by a routine blood Wassermann reaction (four plus both antigens). The probable date of acquisition of the infection was at least seven or eight years prior to the institution of treatment. No primary or secondary lesions had ever been noted. The case is not congenital, as proved by investigation of the parents, and apparently not contagious at the time of marriage five years ago, as the wife and one child, aged 4, are Wassermann negative. Treatment has been intensive and unremitting for two years. Chief reliance has been on neoarsphenamine, alternating first with courses of bismuth salicylate in oil intramuscularly and then mercurosal intravenously. No vacations from treatment were allowed. Repeated Wassermann examinations during the two years have shown no change, although the patient now subjectively has never been better and there is no evidence of visceral syphilis on careful physical examination. Neurosyphilis has been ruled out by spinal fluid examination and clinical observation. Question arises as to further management of the case. Is one justified in continuing intensive treatment longer than two years? Should the patient be further treated or merely observed? If treatment is indicated, what is the best choice of drug or drugs, dosage and time interval between courses? Please omit name.

M.D., New York.

ANSWER.—Assuming that the patient has a nonsymptomatic Wassermann-fast syphilis, the treatment described could be rated as adequate to a latent infection in accordance with the experience of the Cooperative Clinical Group and the United States Public Health Service with Moore as spokesman.

A year's complete rest from all treatment may result in a gradual approach to serologic negativeness, and certainly nothing more than periodic observation, particularly of the cardiovascular system, should be required in a case of this sort. It is true that occasional courses of a heavy metal, particularly bismuth, are favorably regarded in the management of these patients, but this, together with the other described methods of dealing with Wassermann-fastness in latency described in various textbooks, need not be considered until after a prolonged rest period.

LETHAL DOSE OF AMYTAL

To the Editor:—Recently I was called to see a young married woman, who one hour previously had swallowed with suicidal intent, twelve amytal tablets (Lilly), containing 1½ grains (0.1 Gm.) each. She was comatose when I arrived. Respiration was sighing and shallow, the pulse was weak and thready, the temperature was normal, there was no nausea or vomiting, and the pupils were not contracted. A stomach tube could not be introduced, nor could an emetic be administered. Caffeine and later strychnine hypodermically brought her out of her comatose condition. When she was able to swallow, 1 ounce (30 cc.) of whisky was given. What is the lethal dose of amytal and the attendant symptoms? Please outline treatment. The patient made a good recovery, but may there not be some untoward symptoms following an experience of this kind? I would greatly appreciate any suggestion offered. Kindly omit name.

M.D., Ohio.

ANSWER.—A cursory study of the literature does not permit as yet the categorical statement of the lethal dose of amytal. According to Sollmann (Manual of Pharmacology, ed. 4, 1932) the generally fatal dose of amytal is from 2 to 3 Gm. The treatment of such cases requires evacuation of the stomach, carried out with due precautions against aspiration of fluid and leaving in the stomach cathartics, such as magnesium sulphate or fluidextract of cascara. It might also be well to leave hot black coffee in the stomach after the washing. Caffeine or strychnine should be used, even in heroic doses, to antagonize the depression of the nervous system. Elimination might be favored by aminophyllin or another xanthine diuretic and by dextrose phleboclysis. Artificial respiration with oxygen inhalation should be used on the appearance of enfeeblement of respirations. During the stage of reaction with the development of pulmonary complications, the treatment is that of pneumonia. Picrotoxin also is useful.

ILL EFFECTS OF HABITUATION TO BARBITAL

To the Editor:—Can you give me any information about the ill effects, if any, of the continuous use of sodium amytal? I have a friend who is neurotic and feels he must take from six to 15 grains (0.4 to 1 Gm.) daily to control a "nervous nausea." He fears that it may hurt him. He of course has a drug habit from it, which he cannot give up as yet. Can you tell me what harm, either functional or organic, may come from the habit? I have looked through our medical library and in the recent *Cumulative Index Medicus* and have found no information, and no doctor in Rhode Island seems to know definitely of any bad effects, although all of them say that an amytal drug habit is bad.

GEORGE J. MCCURDY, M.D., Providence, R.I.

ANSWER.—The ill effects of barbital derivatives, including isoamylethylbarbituric acid, or amytal, may be grouped under three headings: (1) idiosyncrasy, (2) overdose, and (3) habit formation. In the case under discussion it may be stated definitely that the patient is now suffering from a drug habit. While, so far as available literature goes, surprisingly little

harm seems to have followed the habitual use of amytal, there is a decided danger in this habit formation, arising chiefly from two sources. The one is that all forms of chronic drug narcotism that have been studied for a sufficient length of time are known to lead inevitably to mental and sometimes physical deterioration. Secondly, there is always danger of a fatal overdose being taken when the patient finds that the dose to which he is habituated no longer suffices to produce the desired degree of comfort.

FOR-DYNE

To the Editor:—What is For-Dyne, of the First Texas Chemical Manufacturing Company, Dallas, Texas?

L. N.

ANSWER.—According to the firm's catalogue, For-Dyne consists of Formasal, 5½ grs., Phenacetine, 1 gr., and Caffeine Citrated ½ gr. The ridiculousness of the product is shown by the description of Formasal, which, according to the manufacturers, is "a chemical manufactured by fusing Salicylic and Acetic Acids with Phenolphthalein after which Colchicine Salicylate is added to reinforce action." What would result from the fusing of these three substances one can only guess. It seems hardly possible that there would be a concern in the days of more enlightened chemical procedure that would offer a product to the medical profession with such an unscientific statement. For-Dyne then, according to the manufacturer's statement, may contain acetphenetidin, caffeine citrate, colchicine salicylate, salicylic acid, acetic acid and phenolphthalein, the latter three being a fusion mixture!

PREVENTION OF IMPETIGO IN MATERNITY HOSPITAL

To the Editor:—Will you please give me the latest routine bathing care of new-born babies in maternity hospitals, with special reference to prophylaxis against impetigo. Has any method other than 0.5 per cent ammoniated mercury in oil been successsfully used?

ERNST L. SCHAIBLE, M.D., Gary, Ind.

ANSWER.—Five per cent ammoniated mercury is most satisfactory for the initial anointing of the body of the new-born infant. Of course, proper aseptic technic should be used by all attendants coming in contact with the infant at this time and during its subsequent hospitalization. Persons handling the infant should wear clean gowns and masks and have freshly washed hands. The nurse should carefully scrub her hands before starting the bath, which should be a daily warm sponge bath. Special attention should be given to cleaning the axilla, groins and interdigital spaces. Due care should be exercised not to traumatize the skin by rough handling or rubbing.

POLLENS IN MICHIGAN

To the Editor:—In THE JOURNAL, April 13, page 1359, appeared a query regarding the climatic conditions in Alpena, Mich., with regard to hay fever, and in the April 27 issue, page 1486, appeared an article on pollen studies by O. C. Durham. In this connection I will give some information obtained from the weather bureau, and will quote from the communication from Mr. A. L. Weisner, meteorologist, U. S. Department of Agriculture.

No statistics on the pollen contents of the air are available for this place, but the prevailing direction of the winds during the summer season would indicate that the amount must be very small. The prevailing direction during the summer months is almost a toss up between southeast and northwest. However, the detailed records show that during the daylight hours, from about 9 a. m. to 8 p. m., when winds are more active and pollen is apt to be carried, the winds are almost steady from the southeast, while during the damper night hours, when the winds are lighter, the prevailing direction is northwest.

Alpena is so situated with respect to Lake Huron that all winds with easterly components, from north-northeast to south-southeast are direct lake winds and must cross over from 60 to 120 miles of water before reaching Alpena. Even north and north-northwest winds are almost lake winds, as they cross but short stretches of land before reaching Alpena.

It is not probable that northwest winds, which would have to cross Lake Superior, would bring an appreciable amount of pollen. Hence the only pollen-bearing winds would be westerly and southwesterly. Winds from both of these directions are not prominent during the summer months.

The following table, obtained from a ten year average, gives an estimate of how many hours the wind may blow from each direction during the summer months:

	N	NE	E	SE	S	SW	W	NW	Total Hours
June	59	40	61	192	49	70	91	158	720
July	60	31	42	178	56	91	95	191	744
August	60	39	55	163	70	78	99	180	744
September	54	35	56	143	58	100	114	160	720

I would add that Alpena is the location of the only government weather bureau in the northern half of lower Michigan. The records of our weather bureau show that the prevailing wind at 6 p. m. is northeast, which is a lake wind and should be free from pollen.

E. S. PARMENTER, M.D., Alpena, Mich.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF OPHTHALMOLOGY: The Cincinnati examination previously announced will not be held. The next examination will be given in St. Louis, Nov. 18. *Application must be filed before Sept. 15.* Sec., Dr. William H. Wilder, 122 S. Michigan Ave., Chicago.

American Board of Otolaryngology: Cincinnati, Sept. 14. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Seattle, Aug. 8, Philadelphia, Oct. 10, and St. Louis, Nov. 10. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF RADIOLOGY: Detroit, Dec. 1-2. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

ARIZONA: *Basic Science.* Tucson, Sept. 17. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examination will be held in all centers where there are Class A medical schools and five or more candidates desiring to take the examination, Sept. 16-18. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEVADA: Reno, Aug. 5. Sec., Dr. Edward E. Hamer, Carson City.

NEW HAMPSHIRE: Concord, Sept. 12-13. Sec., Board of Registration in Medicine, Dr. Charles Duncan, State House, Concord.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 16-19. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

OKLAHOMA: Oklahoma City, Sept. 10-11. Sec., Dr. James D. Osborn Jr., Frederick.

PUERTO RICO: San Juan, Sept. 3. Sec., Dr. O. Costa Mandry, Box 536, San Juan.

WISCONSIN: *Basic Science.* Madison, Sept. 21. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Connecticut Homeopathic Report

Dr. Joseph H. Evans, secretary, Connecticut Homeopathic Medical Examining Board, reports the written examination held in Derby, March 12, 1935. The examination covered 7 subjects and included 70 questions. An average of 75 per cent was required to pass. Two candidates were examined, both of whom passed. The following school was represented:

School	PASSED	Year Grad.	Per Cent
Hahnemann Medical College and Hosp. of Philadelphia		(1933)	83.1, 83.9

Colorado April Report

Dr. Harvey W. Snyder, secretary, Colorado State Board of Medical Examiners, reports the written examination held in Denver, April 2, 1935. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. Two candidates were examined, both of whom passed. Five physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Northwestern University Medical School		(1935)	87
Osteopath*			83.5

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Hahnemann Medical College and Hospital, Chicago		(1903)	Iowa
University of Illinois College of Medicine		(1932), (1934)	Illinois
University of Minnesota Medical School		(1917)	Minnesota
University of Buffalo School of Medicine		(1896)	New York

* Licensed to practice medicine and surgery.

Texas Reciprocity Report

Dr. T. J. Crowe, secretary, Texas State Board of Medical Examiners, reports 25 applicants licensed by reciprocity, April 11, 1935. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1927), (1934)	Arkansas
Emory University School of Medicine		(1932)	Georgia
Bennett Medical College, Chicago		(1912)	Nebraska
Chicago College of Medicine and Surgery		(1915)	Oklahoma
Loyola University School of Medicine		(1927)	Illinois
Rush Medical College		(1931)	Illinois
University of Illinois College of Medicine		(1932)	Washington
University of Kansas School of Medicine		(1926)	Kansas
Tulane University of Louisiana School of Medicine		(1918), (1925), (1931)	Oklahoma, Louisiana
Johns Hopkins University School of Medicine		(1930)	Maryland
Harvard University Medical School		(1927)	Minnesota
University of Michigan Medical School		(1930), (1931)	Michigan
University of Nebraska College of Medicine		(1932)	Nebraska
Eclectic Medical Institute, Ohio		(1902)	Ohio
University of Oklahoma School of Medicine		(1933), (1934)	Oklahoma
Jefferson Medical College of Philadelphia		(1933)	S. Carolina
University of Pennsylvania School of Medicine		(1927)	New York
Baylor University College of Medicine		(1933)	Oklahoma
Osteopaths*			Iowa, Michigan

* Licensed to practice medicine and surgery.

Book Notices

Living with the Weather. By Clarence A. Mills, M.D., Ph.D., James T. Heady Professor of Experimental Medicine, University of Cincinnati. Cloth. Price, $1.50. Pp. 206. Cincinnati: Caxton Press, 1934.

Dr. Mills has been studying for the past six years "climatic and weather effects" and has made "continuous observation of patients in clinic and hospital" and "of laboratory animals under controlled conditions." One need not read far in the book to suspect that Dr. Mills feels that Walter Hines Page understated the influence of climate when, in a letter to a friend in 1913, Page said regarding life that "half of it is climate; a fourth of it is occupation; the other fourth companionship. And the climate (with what it does) is three fourths of companionship." "Weather men," says Dr. Mills, "when they speak of weather, mean the behavior of such factors as temperature, pressure, moisture, wind, and sunshine over relatively short periods of time. . . . Climate, on the other hand, refers to the sum total of weather over long periods of time." And according to Dr. Mills, weather and climate are potent, though often unrecognized, factors in practically everything mankind does or doesn't do. No attempt is made by Dr. Mills to present in this book the evidence from which his conclusions are drawn, but he states that "the analysis is based on a prolonged study of the subject and practically all statements made have a certain amount of definite scientific evidence as a foundation." It was Mark Twain who observed that everybody talks about the weather but nobody does anything about it. Dr. Mills talks about the weather and also calls attention to the need of doing something about it—including further study of the part it plays in human affairs, further attention to indoor atmospheric control, and further efforts toward better control of the effects of climate on man that would involve finding "the set of environmental conditions" best suited to his needs. This volume should prove to be of interest to physicians and public health workers in general.

Making Our Minds Behave. By William S. Walsh, M.D. Cloth. Price, $2.50. Pp. 277. New York: E. P. Dutton & Company, Inc., 1935.

Dr. Walsh's book is a popular book of advice and suggestions intended to aid the reader in "getting more out of life," to use the author's words. A variety of subjects are treated, ranging from the initial chapter on "Mental Engineering" to a final chapter on "Expressing Ourselves." This last chapter is a dissertation on the art of making speeches. Chapter headings include "Remote Control," "Secondhand Thinking," "Removing the Mask," which may be translated to mean, respectively, "Some Unconscious Determinants of Behavior," "Prejudices and Superstitions" and "Defensive and Compensatory Behavior." Other chapter headings are less ambiguous, as "The Art of Concentration," "Making Good on the Job," "On Being an Executive" and "Can We Take It?" The author modestly states in the preface that he makes no pretensions toward any systematic presentation of theory of behavior but wishes merely to offer "more or less elementary suggestions which the writer believes to be sound." This is exactly what he does, but it is something of a question as to how helpful such a presentation can be. The work is descriptive and exhortatory. While occasional references are made to dynamics of behavior, such references are too vague to be understood by the lay reader. The author is indefinite where he does refer at all to the common psychologic concepts on which understanding of behavior is based; viz., "he tends to develop a sort of super-ego which fashions ideals of personal conduct, which acts as a censor of his desires and actions" (p. 23). The style, though popular, is cumbersome and involved. The author is markedly repetitive. The book is overburdened with slang. There are innumerable and frequently rather useless references, of which the most flagrant noted reads "There are many good advisers — Lao-Tzu who, incidentally, anticipated many of the tenets of Christ; Confucius, Aurelius, Epicurus, Epictetus, Seneca, Descartes, Pascal, Kempis, La Bruyere, Bacon, Montaigne, La Rochefoucauld, Amiel, Emerson, to mention a few." The book is full of such padding, and could well be reduced to half the present size without loss of content. The author is doubtless more helpful in his personal contacts with his patients than he could possibly be with this book, which is tedious largely on account of the stylistic defects referred to. It will not be helpful to neurotic individuals, because it does not offer them understanding of the sources of the difficulties referred to. It may be helpful to some persons who require only friendly encouragement, but the publishers are hardly justified in the announcement on the jacket of the book to the effect that the work "lifts psychology and psychoanalysis out of their technical terminology and presents them clearly and in simple language." While some psychologic concepts are dealt with, one could hardly obtain the feeblest understanding of psychoanalytic psychology from the book. The author is much more modest in his claims than are his publishers.

Arbeit und Gesundheit: Sozialmedizinische Schriftenreihe aus dem Gebiete des Reichsarbeitsministeriums. Herausgegeben von Professor Dr. Martineck, Ministerialdirigent im Reichsarbeitsministerium. Heft 25: Nervöse und seelische Störungen bei Teilnehmern am Weltkriege, ihre ärztliche und rechtliche Beurteilung. Von Dr. Karl Weiler, Oberregierungsmedizinalrat bei der versorgungsärztlichen Untersuchungsstelle München. Teil II: Geisteskrankheiten und organische Nervenstörungen. Paper. Price, 8.50 marks. Pp. 314, with 30 illustrations. Leipzig: Georg Thieme, 1935.

Weiler contributes the twenty-fifth number of Work and Health, edited by Martineck. It consists of an analysis of the nervous and mental disturbances in association with the World War. After an introduction as to how this work was carried out, Weiler discusses dementia praecox (schizophrenia). This chapter is divided into three parts: dementia praecox in general, influence of war and dementia praecox, and finally the conclusions. The second chapter takes up the manic depressive psychoses and consists of a discussion of manic depressive psychoses in general and in association with the World War, followed by conclusions. The third chapter deals with epilepsy and is divided into two parts: epilepsy as an individual entity and the influence of the war of epilepsy. The fourth chapter discusses nervous and mental diseases of syphilitic origin. This is divided into a general discussion of dementia paralytica and tabes dorsalis and the various syphilitic nervous and mental diseases in relation to the war. The fifth chapter considers other organic diseases of the central nervous system, such as multiple sclerosis, epidemic encephalitis and syringomyelia. The sixth chapter deals with the influence of power and force on the peripheral nerves, the spinal cord and the brain. There are a summary and an appendix at the end of the book. Many of the author's conclusions are open to question and discussion. There is almost no bibliography. The book does not offer much to the student interested in these subjects.

Handbook of Anæsthetics. By J. Stuart Ross, M.B., Ch.B., F.R.C.S.E., and H. P. Fairlie, M.D., Anæsthetist to the Western Infirmary, Glasgow. With a chapter upon Local Anæsthesia by W. Quarry Wood, M.D., F.R.C.S.E., Assistant Surgeon, Edinburgh Royal Infirmary. Fourth edition. Cloth. Price, $4. Pp. 299, with 66 illustrations. Baltimore: William Wood & Company, 1935.

The preparation of this edition has been the sole responsibility of H. P. Fairlie. Anesthetic agents and methods of their administration that are in general use in Great Britain are described. The equipment used differs considerably from the equipment commonly in use in the United States and Canada and should be interesting to members of the profession in this country on that account. Stress is laid in the first chapters on the fundamentals underlying the absorption and physiologic action of anesthetic drugs. Shock in relation to anesthesia is adequately discussed in chapter 2. In chapter 7 the newer basal narcotics tribrom-ethanol (Avertin) and evipan sodium are described. Ether is recognized as the most dependable and safest anesthetic agent for the majority of operative procedures. The dangers associated with administration of chloroform are well outlined. The importance of maintaining an adequate airway during administration of an anesthetic by inhalation is stressed. One page is devoted to a description of Waters' carbon dioxide absorption technic. Accidents encountered, and methods of avoiding them and of treating them, are outlined. A chapter discussing the choice of anesthetic is limited to the anesthetics producing general anesthesia. The next chapter deals with local anesthesia and the following chapter with spinal anesthesia.

The Biochemistry of the Eye. By Arlington C. Krause, M.A., Ph.D., M.D., Instructor in Ophthalmology, The Johns Hopkins Medical School. The Wilmer Ophthalmological Institute, The Johns Hopkins Hospital and University, Monograph No. 2. Cloth. Price, $3.25. Pp. 264, with 17 illustrations. Baltimore: The Johns Hopkins Press; London: Oxford University Press, 1934.

Ocular biochemistry has been largely a neglected field until recent years. In this book the author has attempted to review somewhat critically the more important and more trustworthy papers that have appeared, mostly in the last thirty years. The book is essentially a review of the biochemical literature pertaining to the eye and should serve as a convenient reference source to researchers in this field. It can be read profitably only by those who have a ready grasp and appreciation of modern biochemical theory and methods. The author reviews the literature on the chemistry of the external secretions of the eye, conjunctiva, sclera, cornea, uveal tract, retina, aqueous humor, vitreous humor and lens. The literature related to the biochemistry of the eye and published up to and including 1933 is considered. It is probable that much of the quantitative data considered in this work will have to be revised, because many of the biochemical methods that were used are not specific or truly quantitative. The reader may conclude after reading this book that, although it appears that a great amount of time and effort has been spent in work on the biochemistry of the eye, but little is known that is at present of much benefit in considering the various pathologic processes of the eye. While this is probably true, books of this type are useful in their attempt to correlate scattered knowledge and thus may serve to point the way for future work in this difficult field.

Hospital Accounting and Statistics: A Manual for American Hospitals. Authorized for publication by the Trustees of the American Hospital Association upon recommendation of the Council on Community Relations and Administrative Practice. Cloth. Price, $1. Pp. 85. Chicago: American Hospital Association, 1935.

The committee of the American Hospital Association to be credited with this book states that the purpose is to suggest practical ways by which (*a*) the administrator can use accounts to control his institution and to interpret his results to others, and (*b*) the bookkeeper or accountant can accumulate and present useful information with a maximum of clarity and a minimum of routine labor. It successfully carries out the purpose of the committee. It is a manual for the hospital bookkeeper and as such is useful for the hospital administrator. It is neither a textbook on bookkeeping nor a book of sample forms nor a textbook on hospital administration. This book will be an aid to all bookkeepers and administrators.

Studies on Cell Growth (Part II). The Growth in Vitro of Normal Mouse Cells and of Mouse Cancer Cells (Carcinoma, Sarcoma) in Neutral and Immune Media (Serum Plasma). By M. J. A. des Ligneris, M.D., L.M.S.S.A. No. XXXIV, Vol. VI, Publications of the South African Institute for Medical Research. Edited by the Director. Paper. Pp. 313-322, with 109 illustrations. Johannesburg: South African Institute for Medical Research, 1934.

The purpose of this work is to decide the controversy between Lumsden and Ludford. According to Lumsden there are specific anticancer substances formed in animals, which are immunized by inoculation with tumor tissue. The action of these serums is highly specific, according to Lumsden. The specificity against the malignant cells was demonstrated by this author in tissue cultures in which he found that the malignant cells were picked out and rapidly killed and the nonmalignant cells remained more or less undamaged. Ludford, on the other side, came to the conclusion that those cells which were considered by Lumsden to be cancer cells in the tissue cultures were not malignant cells but stroma elements. In order to settle this question Des Ligneris inoculated sheep with tumor material from mouse carcinomas and with normal mouse organs and compared the growth of mouse carcinoma tissue and mouse sarcoma tissue as well as of normal mouse kidney, liver, lung and spleen in serum or plasma, which was obtained from the injected animals with the growth in normal sheep serum or plasma. The results were that the antibodies that had developed in the serum of sheep injected with mouse carcinoma tissue had only antispecies characters and no kind of specifically antimalignant characteristics. The author obtained the same effect on mouse carcinoma or mouse sarcoma cells in vitro whether the serum or plasma used originated from a sheep injected with normal mouse organs or with mouse carcinoma. Furthermore, the effect on normal mouse cells in vitro was the same whether antimouse sheep serum was used that was produced by inoculation of normal mouse organs or of mouse carcinoma. There are illustrations of tissue cell for demonstration.

Guiding Your Child Through the Formative Years, From Birth to the Age of Five. By Winifred De Kok, M.R.C.S., L.R.C.P. Cloth. Price, $2. Pp. 191. New York: Emerson Books, Inc., 1935.

The author discusses in a clear, concise manner fears, tantrums, habits, freedom, play, independence, sex, education and the various problems with which one is daily confronted in the rearing of children. Having been trained in psychoanalysis, she attacks many of the problems of childhood from the psychoanalytic point of view and she uses the experiences in the rearing of her own children as examples of proper management. While it is impossible to agree fully with the methods outlined and many of the statements, the book in general should be found useful. Those concerned with child management will find much that is of interest.

Die unsichtbaren Krankheitserreger, filtrierbare Vira: Ein Lehrbuch für Ärzte und Tierärzte. Von Dr. Josef Baló, o. ö. Professor der pathologischen Anatomie und Pathohistologie an der Franz-Joseph-Universität Szeged. Paper. Price, 24 marks. Pp. 311, with 42 illustrations. Berlin: S. Karger, 1935.

In the present German edition the author has rewritten and brought down to October 1934 the material included in the Hungarian edition, which appeared in 1931. The book is divided into two sections. The first consists of a brief review of the available information concerning the general characteristics of filtrable viruses and the second, which is the main part of the work, deals with most of the important virus diseases of man and animals and a few representative diseases affecting fish, insects and plants. The individual diseases are well arranged in groups according to the author's idea of classification: (1) pox diseases of man and animals, (2) herpes and herpes-like diseases, (3) neurotropic filtrable viruses, (4) organotropic viruses, (5) diseases giving the picture of a general septicemia and (6) viruses associated with proliferative conditions. The discussions in the main are limited to concise reviews of the literature and are followed in each instance by an extensive bibliography, in which an occasional important omission has been noted. One chapter is devoted to the filtrable forms of the tubercle bacilli and to bacteriophage. The details of technical procedures are not generally emphasized except for an appendix dealing with filters and filtration. Considering the fact that there are available relatively few books dealing with the rapidly accumulating information on the important subject of filtrable virus diseases, this manual is a contribution of some value in this field.

Key-Catalogue of Parasites Reported for Carnivora (Cats, Dogs, Bears, etc.) with Their Possible Public Health Importance. By C. W. Stiles and Clara Edith Baker. U. S. Treasury Department, Public Health Service. National Institute of Health Bulletin No. 163 (Continuation of Hygiene Laboratory Bulletin Services). Paper. Price, 20 cents. Pp. 913-1223. Washington, D. C.: Supt. of Doc., Government Printing Office, 1935.

The present bulletin is part 8 of the well known host catalogue being compiled by Stiles and his co-workers. Such compilations will be of great assistance to parasitologists, but it is to be regretted that the data are given in such an abbreviated style that it is often difficult to secure information on a desired subject.

Festschrift: Ino Kubo zu seinem 60. Geburtstag (26. Dezember 1934) von seinen ausländischen Freunden gewidmet. Cloth Pp. 378, with illustrations. Tokyo: The Herald Press, Ltd., 1934.

This book contains fifty-eight rather short articles of clinical and practical nature by European and American authors on diseases of the nose, throat and ear and their complications. The book is issued in celebration of the sixtieth anniversary of Ino Kubo, professor of otorhinolaryngology in the University of Fukuoka, Japan. The larger number of articles by far are in the German language. Various European countries are represented and there are two American contributors. The book will be of interest to specialists in the diseases with which it deals.

Medicolegal

Workmen's Compensation Acts: Trauma and Arthritis.—As the result of a cave-in in the mine in which Duchant was working he fractured several ribs and two of the dorsal vertebrae. He was hospitalized for two and one-half months and his employer paid him compensation. At the time of the accident, however, he was suffering from an advanced and quite generalized progressive hypertrophic arthritis of the thoracic and lumbar spine. When he was discharged from the hospital his employer put him at light work, which he performed with great difficulty because of pain in his back and shoulders caused by a stiff or "poker" spine. Alleging that the accident had aggravated his arthritic condition, he brought proceedings under the Minnesota compensation act but the industrial commission denied him compensation. He then appealed to the Supreme Court of Minnesota.

When Duchant, said the Supreme Court of Minnesota, was discharged from the hospital, according to medical testimony, roentgenograms indicated that the injury suffered in the cave-in had healed and that the condition of his spine was no different from what it would have been had he suffered no industrial injury. In fact, one physician testified that the hospitalization had been beneficial to the arthritic condition. Other physicians testified that the stiffness of Duchant's spine was due to the progress of the arthritis and that the injury contributed nothing to his present condition. Duchant contended that his case came within the doctrine announced in several Minnesota cases that where a hernia develops from strain or injury, suffered in the course of employment, a preexisting weakness or susceptibility to hernia on the part of the worker would not bar compensation. But, answered the Supreme Court, the case at bar is easily distinguishable from the cases cited. Here we have a condition, well advanced at the time of injury, which according to the testimony of disinterested physicians was neither aggravated nor caused by the injury. In addition there is credible testimony to the effect that the arthritic condition was benefited by the hospitalization made necessary by the back injury.

The Supreme Court accordingly affirmed the action of the industrial commission denying compensation to the workman.—*Duchant v. Oliver Iron Mining Co. (Minn.), 256 N. W. 905.*

Pharmacists: Degree of Care Required.—The plaintiff was suffering a skin irritation from poison ivy. Her physician prescribed a preparation containing sugar of lead, which she applied to the inflamed area. When she went to her pharmacist to have the prescription refilled, he advised her to stop using sugar of lead and sold her a preparation that he himself manufactured. She applied his preparation, and the inflamed skin became blacker and blacker. When the plaintiff called the attention of her pharmacist to this, he advised her to keep on using his preparation. Not until after she had used two and one-half jars of it did he advise her to consult a physician. The physicians whom she consulted were able, by a painful, nerve wrecking process, to remove the greater part of the blackness in her skin, but at the time of the trial there was still a dark spot on the plaintiff's breast, which would be permanent unless she submitted to a skin grafting operation. She sued her pharmacist.

At the trial, the pharmacist-defendant testified that he manufactured the preparation that he sold the plaintiff and that it contained sulphur, oil of wintergreen, vaseline and lanolin. According to his testimony, he told the plaintiff at the time that if she used his "skin cure," not to use it in connection with sugar of lead. The plaintiff testified, however, that when she purchased his "skin cure" she had already been using the sugar of lead preparation for several days, that she told the defendant that she had been doing so, that he told her not to use any more of it, and that she used none after she began the "skin cure." The jury returned a verdict in favor of the plaintiff, and the defendant moved for a new trial, basing his motion in part on the claim that the court should have sustained his demurrer to the plaintiff's evidence. The trial court conceded its supposed error and for that and other reasons ordered a new trial. The plaintiff then appealed to the Supreme Court of Kansas.

It was urged on behalf of the plaintiff, said the Supreme Court, that the defendant's demurrer could not be sustained, since the plaintiff's evidence showed negligence on the defendant's part. With this the Supreme Court agreed. The defendant, said the court, was a registered pharmacist, who was selling drugs and compounding medicines. The general rule is that a registered pharmacist is required to use great care in the sales he makes. It was a question of fact whether the defendant, when he sold his "skin cure," explained to the customer that sugar of lead could not be used and that it must be thoroughly washed out of the flesh before the "skin cure" was applied. The defendant's "skin cure" contained sulphur, the inevitable reaction of which would be to cause blackness, as the defendant well knew. When the blackness appeared and the plaintiff called the defendant's attention to it, he told her to keep on using his preparation and the blackness would come off. She followed his advice, and the area to which the "skin cure" was applied became blacker and blacker. Even then the defendant told the plaintiff that she should keep on using his remedy; that it would finally remove the blackness.

The Supreme Court of Kansas quoted with approval the rule laid down in 55 Am. St. Rep. 251, in a note to *Howes* v. *Rose*, as follows:

> In the discharge of their functions, druggists, apothecaries, and other persons dealing in drugs, poisons, and medicines, are required, not only to be skilful, but also exceedingly cautious and prudent, in view of the terrific consequences which may attend the least inattention on their part. The highest degree of care known among practical men must be used by them to prevent injury from the use of their compounds, and they are held to a special degree of responsibility corresponding with their superior knowledge and are generally held liable for the slightest negligence.

In this case, the pharmacist-defendant did not exercise the care required of him in the sale of his "skin cure." He knew the effect of the combination of the substances of which it was made up and his customer did not. He persisted in telling his customer to keep on using the preparation and that it would finally remove the darkness. Such conflicts as there were in the evidence were such as must be determined by a jury.

For the reasons stated and others, the judgment of the trial court was reversed and the cause remanded for a new trial.—*Fuhs v. Barber (Kan.), 36 P. (2d) 962.*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Cincinnati, Sept. 14-20. Dr. William P. Wherry, 107 South 17th Street, Omaha, Executive Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Sky Top, Pa., Sept. 16-18. Dr. James R. Bloss, 418 Eleventh Street, Huntington, W. Va., Acting Secretary.

American Congress of Physical Therapy, Kansas City, Mo., Sept. 9-12. Dr. Nathan H. Polmer, 921 Canal Street, New Orleans, Secretary.

American Roentgen Ray Society, Atlantic City, N. J., Sept. 24-27. Dr. E. P. Pendergrass, 3400 Spruce Street, Philadelphia, Secretary.

Colorado State Medical Society, Estes Park, September 5-7. Mr. Harvey T. Sethman, 537 Republic Building, Denver, Executive Secretary.

Michigan State Medical Society, Sault Ste. Marie, Sept. 23-25. Dr. Burton R. Corbus, 313 Metz Building, Grand Rapids, Acting Secretary.

Mississippi Valley Conference on Tuberculosis, Madison, Wis., Sept. 12-14. Mr. A. W. Jones, 613 Locust Street, St. Louis, Secretary.

National Medical Association, New Orleans, Aug. 11-17. Dr. C. A. Lanon, 431 Green Street, South Brownsville, Pennsylvania, Secretary.

Northern Minnesota Medical Association, Duluth, Aug. 12-13. Dr. Oscar O. Larsen, Detroit Lakes, Secretary.

North Pacific Pediatric Society, Seattle, August 9-10. Dr. F. H. Douglass, 509 Olive Street, Seattle, Secretary.

Oregon State Medical Society, Gearhart, Sept. 19-21. Dr. Blair Holcomb, Stevens Building, Portland, Secretary.

Utah State Medical Association, Logan, September 5-7. Dr. George N. Curtis, Judge Building, Salt Lake City, Secretary.

Washington State Medical Association, Everett, Aug. 12-14. Dr. Curtis H. Thomson, 1305 Fourth Avenue, Seattle, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 17-20. Mr. J. G. Crownhart, 119 East Washington Avenue, Madison, Secretary.

Wyoming State Medical Society, Lander, Aug. 12-13. Dr. Earl Whedon, 50 North Main Street, Sheridan, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

189: 753-892 (June) 1935

Etiologic and Pathologic Factors in Polycythemia Vera. P. Reznikoff, N. C. Foot and J. M. Bethea, New York.—p. 753.

*Macrocytic Anemia with Aplastic Features Following Application of Synthetic Organic Hair Dye. C. W. Baldridge, Iowa City.—p. 759.

*The Neurologic Aspect of Leukemia. R. S. Schwab and Soma Weiss, Boston.—p. 766.

Fatal Ethylene Dichloride Poisoning. W. C. Hueper, Wilmington, Del., and C. Smith, Philadelphia.—p. 778.

Spindle Cell Sarcoma of Pancreas. E. J. Oesterlin and R. W. Blumenthal, Milwaukee.—p. 784.

Congenital Cysts of Lung. J. P. Scott and A. D. Waltz, Philadelphia.—p. 788.

Factors Affecting Appearance and Duration of Glycosuria. C. S. Robinson, R. C. Derivaux and Barbara Hewell, Nashville, Tenn.—p. 795.

Variations in Blood Pressure in Renal Tuberculosis. C. G. Morlock and B. T. Horton, Rochester, Minn.—p. 803.

Factors Conditioning Transmission of Syphilis by Blood Transfusion. H. J. Morgan, Nashville, Tenn.—p. 808.

Early Response to Venesection with Observations on So-Called Bloodless Venesection. W. A. Brams and J. S. Golden, Chicago.—p. 813.

Pain in Thrombo-Angiitis Obliterans: Clinical Study of One Hundred Consecutive Cases. Grace A. Goldsmith and G. E. Brown, Rochester, Minn.—p. 819.

Four-Lead Electrocardiogram in Coronary Sclerosis: Study of Series of Consecutive Patients. A. Bohning and L. N. Katz, Chicago.—p. 833.

Coronary Thrombosis and Its Effect on Size of Heart. E. F. Horine and M. M. Weiss, Louisville, Ky.—p. 858.

Macrocytic Anemia Following Use of Hair Dye.—Baldridge discusses three cases of macrocytic anemia in women who had dyed their hair just before the application of permanent waves. In one of these the temporary changes in the blood were typical of aplastic anemia. It is essential that more cases be studied in order to determine the exact relationship between the dye and the blood changes. The part played by the permanent wave must also be established. Patients having pernicious anemia are likely to lose pigment from the hair at an early age, so that they have this added cause for using hair dye. Therefore the presence of a macrocytic anemia in a patient with dyed hair does not establish a relationship between the two conditions. It is possible that the substance which caused the anemia was not the original chemical compound applied to the hair but rather some product that resulted from heating the initial compound.

Neurologic Aspect of Leukemia.—Schwab and Weiss cite the clinical course of an unusual case of acute lymphatic leukemia. The presenting manifestations were facial diplegia and a spinal fluid, under elevated pressure, containing 2,000 cells and increased amounts of protein. The usual clinical manifestations, including the blood picture, developed later over a period of ten weeks. Only about 25 per cent of cases in which there is histologic evidence of leukemic infiltration of the central nervous system exhibit neurologic signs. An analysis of the records of 334 cases of leukemia in Boston revealed an incidence of 20.5 per cent with neurologic signs, excluding retinal lesions. The frequency of neurologic complications in the acute and chronic and in the lymphatic and myelogenous types of leukemia was about the same. The most frequently observed neurologic signs were unilateral or bilateral palsies of the seventh and sixth nerves, with less frequent involvement of the fifth, eighth, ninth, tenth, eleventh and twelfth nerves. Absent deep reflexes, pyramidal signs, paresthesias and signs of meningeal irritations have also been encountered. The neurologic signs, and particularly involvement of the cranial nerves, often exhibit rapid fluctuations. In 73.6 per cent of thirty-four cases the spinal fluid showed abnormal changes, as indicated by increased cell count, increased protein content and elevated pressure. In view of the frequent involvement of the central nervous system, systematic neurologic examination of the patients and study of the spinal fluid may be of aid in the diagnosis and management of patients with leukemia.

Archives of Neurology and Psychiatry, Chicago

33: 1143-1386 (June) 1935

*Syndrome of Superior Cerebellar Artery and Its Branches. C. Davison, S. P. Goodhart and N. Savitsky, New York.—p. 1143.

Nature of Delirium and Allied States: Dysergastric Reaction. H. G. Wolff, New York, and D. Curran, London, England.—p. 1175.

*Dementia Paralytica: Results of Treatment with Tryparsamide. H. C. Solomon and S. H. Epstein, Boston.—p. 1216.

Intracranial Arteriovenous Fistula: III. Diagnosis by Discovery of Arterial Blood in Jugular Veins. B. T. Horton, Rochester, Minn.; L. H. Ziegler, Albany, N. Y., and A. W. Adson, Rochester, Minn.—p. 1232.

*Quinine Therapy in Cases of Multiple Sclerosis Over a Five Year Period. R. M. Brickner, New York.—p. 1235.

Syringomyelia and Intramedullary Tumor of Spinal Cord. R. P. Mackay and J. Favill, Chicago.—p. 1255.

Effects of Alterations in Posture on Cerebrospinal Fluid Pressure. J. Loman, A. Myerson and D. Goldman, Boston.—p. 1279.

Microcephalia Vera: Study of Two Brains Illustrating the Agyric Form and the Complex Microgyric Form. J. G. Greenfield, London, England, and J. M. Wolfsohn, San Francisco.—p. 1296.

Syndrome of Superior Cerebellar Artery.—Davison and his associates cite nine cases of closure or obstruction of the superior cerebellar artery. Homolateral signs and symptoms due to involvement of the cerebellar lobes or the brachium conjunctivum were present in six cases. Involuntary movements of the nature of tremors were noted in only three. Contralateral sensory disturbances were of the dissociated or syringomyelic type and consisted of hemihypalgesia and hypothermesthesia of the face and body. All other modalities of sensation were intact. Such spinothalamic sensory disturbances were present in four cases. In the cases with spinothalamic involvement the lateral parts of the medial lemniscus (spinothalamic component) were diseased as a result of thrombosis of the superior cerebellar artery. In addition to the foregoing symptoms and signs, which are typical of the syndrome of the superior cerebellar artery and its branches, there were other neurologic disturbances, such as diminution to absence of the deep reflexes, weakness of the extremities, vomiting, dizziness and dysarthria. In some cases the signs of cerebellar involvement and sensory disturbances could not be elicited because the patients were in an unconscious state as a result of closure of the superior cerebellar artery or because these signs were obscured by other cerebral lesions. Complete obstruction of the superior cerebellar artery (in two cases) destroys the brachium conjunctivum, the mesencephalic root of the fifth nerve, the spinothalamic component of the medial lemniscus, the lobulus anterior, lobulus simplex, lobulus ansiformis crus I and lobulus floccularis and part of the cerebellar nuclei (dentate, emboliform and globose nuclei). The lobulus II vermalis, lobulus IV vermalis and lobulus C_2 vermalis in these cases are spared unless both mesial branches of the superior cerebellar artery are pathologically affected. In the cases of incomplete closure of the superior cerebellar artery, the extent of destruction of the respective structures depends on the degree of the vascular obstruction. In two cases there was involvement of the nuclei of the sixth and seventh nerves, probably due to an anomalous distribution of the superior cerebellar artery. In one case there was occlusion of the branch of the superior cerebellar artery, which supplies essentially the brachium conjunctivum and the lateral part of the medial lemniscus. In only one case was there selective involvement of the dentate artery, a branch of the superior cerebellar artery.

Tryparsamide in Treatment of Dementia Paralytica.—Solomon and Epstein present an analysis of the effect of tryparsamide therapy in a series of eighty-one cases of dementia paralytica in which treatment was begun between the years 1923 and 1930 and in which the condition was determined in 1933. Some of the patients received other forms of antisyphilitic treatment (exclusive of fever therapy) prior to or during treatment with tryparsamide. Clinically, in thirty-four patients the condition was considered to be arrested, in twenty-four to be stationary and in twenty-three to be unimproved. In the

course of the years, fourteen patients died, but in only five cases did death appear to be due to unarrested dementia paralytica. The spinal fluid became normal in thirty patients and was greatly improved in thirteen, moderately improved in eight and unimproved in twenty-nine. There were sixty-four patients in the series who received no other treatment than by tryparsamide. In eighteen of these the spinal fluid became normal, in ten it was greatly improved, in seven it was moderately improved and in twenty-eight it showed no change. A specimen of the fluid could not be obtained in one case. The period elapsing between the beginning of treatment and the time when the spinal fluid became normal varied from less than a year to more than nine years. The number of injections of tryparsamide given up to the time when the fluid became normal varied from twenty to 230. No significant difference in results was found in patients receiving tryparsamide alone and in those receiving other types of antisyphilitic treatment, other than fever therapy, in conjunction with tryparsamide. Seventeen patients of the series who did not respond satisfactorily to tryparsamide were subsequently given fever therapy, with strikingly beneficial results. The spinal fluid became normal in twelve patients, was greatly improved in three and was moderately improved in two, whereas before fever therapy the spinal fluid was unimproved in fifteen and only moderately improved in two. The clinical improvement was equally striking. Before fever therapy fourteen patients were considered to show no improvement. After fever therapy eight showed the disease to be arrested, and in six it was stationary. Before fever treatment, in three patients the disease was considered to be stationary. In two of these it was later considered to be arrested without showing notable defect, and in one the condition remained unchanged. The results of tryparsamide treatment in this series compared with the results in a series of 173 dementia paralytica patients treated with malaria did not differ to an extent that can be considered significant.

Quinine Therapy in Multiple Sclerosis.—Brickner has employed quinine hydrochloride for five years in treating patients with multiple sclerosis. The forty-nine patients had a total of 308 symptoms. The majority (about 73 per cent) of the symptoms of a duration of two years or less have improved. There was improvement in about 44 per cent of the symptoms of longer standing. Thirty-five symptoms have regressed during treatment. Only seventeen new symptoms have appeared in the whole group, and of these only nine were permanent. In twenty-five patients the condition is in a state of remission or they have shown marked improvement and are working or able to work; of these, twenty are free from incapacitating symptoms and five are almost free. None who were able to work prior to treatment are now incompetent to do so. The condition in ten is apparently in a state of arrest, though the patients are incapacitated to a greater or lesser degree; two appear to be emerging from this state into one of improvement. Eight are worse than they were prior to treatment. Of these, three have died. An additional patient, in whom regression of the multiple sclerosis did not occur, died of pneumonia. All but two of those who have experienced remissions or improvements have maintained them. The dosage of quinine hydrochloride must be determined separately for each patient. As much quinine should be given as is possible without cinchonism. The administration of quinine must be continued indefinitely. The medication is given orally, in the form of quinine hydrochloride. When improvement cannot be obtained, it is worth while to try to arrest the process.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

16: 321-386 (June) 1935

The Scotch Douche and Some Experimental Studies on Its Metabolic Influence. S. Benson and P. L. Bergstrom, Chicago.—p. 327.
Aids in Rehabilitation. F. J. Gaensler, Milwaukee.—p. 339.
Physical Therapy in General Surgery. A. S. Jackson, Madison, Wis. —p. 342.
Electrocoagulation of Tonsils. G. F. Zerzan, Holyrood, Kan.—p. 345.
Further Comment on Electrocoagulation of Tonsils and Adenoids. L. L. Doane, Butler, Pa.—p. 347.
"The Reaction" in Electrosurgical Tonsillectomy: The Multiple Stage Operation. L. J. Silvers, New York.—p. 350.
Further Studies with Zinc Ionization in Nasal Allergy. A. R. Hollender, Chicago.—p. 359.

Arkansas Medical Society Journal, Fort Smith

31: 211-224 (May) 1935

Health Examination in Relation to Cancer in Women. Ruth Ellis, Fayetteville.—p. 211.
Late Syphilis. S. F. Hoge, Little Rock.—p. 213.
Sodium Thiocyanate as a Prophylaxis and in Treatment of Bacillary Dysentery, with Especial Emphasis on Shiga Type. L. D. Massey, Osceola.—p. 216.

Delaware State Medical Journal, Wilmington

7: 123-140 (June) 1935

Angina Pectoris: Its Treatment with Insulin Free Pancreatic Extract, "Tissue Extract No. 568" (Desympatone). J. B. Wolffe, Philadelphia.—p. 123.
Opium: Its Relation to Civilization and Health. J. C. Doane, Philadelphia.—p. 129.
Negative Aspect of Analgesia in Labor. C. L. Hudiburg, Wilmington. —p. 134.
Therapeutic Pointers. E. Podolsky, Brooklyn.—p. 136.

Iowa State Medical Society Journal, Des Moines

25: 281-326 (June) 1935

Group Organization. G. F. Harkness, Davenport.—p. 281.
The Power of Organization. T. A. Burcham, Des Moines.—p. 282.
Ragweed Dermatitis. L. J. Frank, Sioux City.—p. 283.
Mucous Colitis: Its Clinical Study. C. J. Drueck, Chicago.—p. 285.
Treatment of Pelvic Infections. A. C. Page, Des Moines.—p. 287.
Review of Ureteral Surgery. H. W. Scott, Fort Dodge.—p. 292.
*Proper Method of Treating Uterine Cancer. E. D. Plass, Iowa City. —p. 293.
The Sciatic Syndrome. J. I. Marker, Davenport.—p. 297.
Diagnosis of Gastric Malignancy. J. T. Strawn, Des Moines.—p. 299.
Surgical Procedures for Neoplasms of Right Half of Colon. C. S. Krause, Cedar Rapids.—p. 303.
Management of Cases of Apparent Sterility. B. J. Dierker, Fort Madison.—p. 304.
Fracture of Carpal Scaphoid: Report of Case. J. A. W. Johnson, Newton.—p. 307.

Uterine Cancer.—Plass believes that every patient with abnormal vaginal bleeding should be examined bimanually. If the cervix appears benign but does not respond to the usual treatment for cervical erosion, biopsy is demanded. Supravaginal hysterectomy should never be employed for the treatment of supposedly benign uterine lesions, unless the cervix appears normal. The cervix after such an operation constitutes a source of danger, since carcinoma may develop later. Ordinary vaginal and abdominal total hysterectomy do not constitute adequate treatment for cervical cancer, except possibly in very early cases in which the diagnosis can be made only microscopically. Operative intervention in even early cases of cervical carcinoma is justified only if the operator is prepared to remove the upper third of the vagina and the parametrium on each side practically to the pelvic wall by the radical hysterectomies of Wertheim or Schauta. Such operations have a primary mortality of from 10 to 20 per cent, and there are many who feel that all groups of cervical carcinoma should be treated by radiation therapy. Proper radiation treatment consists in the use of both high voltage x-rays and radium as soon as a positive diagnosis has been made. Abnormal bleeding from the uterus itself demands diagnostic curettage with microscopic examination of the curettings. Complete hysterectomy should be performed for adenocarcinoma of the uterus. In certain instances radium and x-radiation may be employed successfully, but this method of treatment has not yet obtained wide acceptance.

Journal of Comparative Neurology, Philadelphia

61: 407-594 (June 15) 1935

Nerve Endings in Human Pleura Pulmonalis. O. Larsell, Portland, Ore.—p. 407.
Limb Movements Studied by Electrical Stimulation of Nerve Roots and Trunks in Amblystoma. J. S. Nicholas, New Haven, Conn., and D. H. Barron, Albany, N. Y.—p. 413.
Thalamus of Turtles and Thalamic Evolution. J. W. Papez, Ithaca, N. Y.—p. 433.
Change in Volume of Olfactory and Accessory Olfactory Bulbs of Albino Rat During Postnatal Life. C. G. Smith, Toronto.—p. 477.
Corticifugal Fiber Connections of Cortex of Macaca Mullatta: Frontal Region. F. A. Mettler, Ithaca, N. Y.—p. 509.
Cerebrospinal Hydrodynamics: V. Studies of Volume Elasticity of Human Ventriculosubarachnoid System. J. H. Masserman, Baltimore.—p. 543.
Blood Supply of Lateral Geniculate Body in Rat. Y.-C. Tsang, Chicago. —p. 553.
Hippocampal and Parahippocampal Cortex of the Emu (Dromiceius). E. H. Craigie, Toronto.—p. 563.

Journal of Urology, Baltimore

33: 521-676 (June) 1935

Renal Ectopia. W. G. Sexton, Marshfield, Wis.—p. 521.
Solitary Cyst Associated with Tuberculosis of Kidney: Review of Literature and Case Report. J. F. Balch, Indianapolis.—p. 526.
Papillary Epithelioma of Renal Pelvis: Report of Three Cases. W. N. Taylor, Columbus, Ohio.—p. 531.
*Wilms' Tumor: Clinical and Pathologic Study. J. T. Priestley and A. C. Broders, Rochester, Minn.—p. 544.
The Surgery of the Upper Ureter. A. Randall, Philadelphia.—p. 552.
Ureteral Ectopia with Congenital Hypoplastic Pelvic Kidney. A. J. Sparks, Fort Wayne, Ind.—p. 559.
Tumors of the Bladder. A. Graham, Cleveland.—p. 565.
Bladder Tumors: Some Results, Favorable and Unfavorable. R. Pearse, Toronto.—p. 570.
Interstitial Cystitis. J. K. Ormond, Detroit.—p. 576.
Further Studies on Use of Ketogenic Diet for Bacilluria. E. N. Cook and W. F. Braasch, Rochester, Minn.—p. 583.
Physiology of Urinary Tract: Consideration of Factors Relating to Both Pathology and Treatment. R. E. Cumming, Detroit.—p. 589.
Sarcoma of Urinary Tract. C. E. Jelm, Akron, Ohio.—p. 599.
President's Address: Report Concerning Organization of Southeastern Branch of the American Urological Association. M. L. Boyd, Atlanta, Ga.—p. 603.
Pain in Cases of Dilated Pelvis and Ureter. G. R. Livermore, Memphis, Tenn.—p. 607.
Rôle of Congenital Anomalies in Production of Urologic Conditions in Children, with Especial Mention of Congenital Idiopathic Dilatation of Ureter. G. J. Thomas and J. C. Barton, Minneapolis.—p. 611.
Bladder Tumors: Historical Study of Treatment and Pathology. E. Beer, New York.—p. 612.
Prostatic Carcinoma. B. S. Barringer, New York.—p. 616.
Problem of Lesions of Right Upper Quadrant. W. E. Lower, Cleveland.—p. 621.
Nupercaine as Spinal Anesthetic, with Especial Reference to Employment of Nupercaine Solution of High Dilution. H. S. Jeck, New York.—p. 623.
Treatment of Chronic Prostatitis by Injection. O. Grant, Louisville, Ky.—p. 631.
Repair of Rectal Tear and Recto-Urethral Fistula: Report of Six Cases. W. W. Scott, Rochester, N. Y.—p. 643.
*New Acid Medication in Treatment of Bacilluria: Preliminary Report. A. M. Crance and T. W. Maloney, Geneva, N. Y.—p. 657.
Immobilizing Retractor Which Allows Direct Exposure of Bladder Carcinoma to X-Ray Therapy. D. K. Rose, St. Louis.—p. 664.

Wilms' Tumor.—Priestley and Broders believe that probably the most common malignant growth that affects the kidneys of children is Wilms' tumor. Sixty-five cases of this tumor observed at the Mayo Clinic are reviewed. Thirty-seven of the patients were in advanced stages of the disease at the time of the original examination, and they received irradiation or symptomatic treatment alone; the remaining twenty-eight patients underwent operation and in twenty nephrectomy was performed. An abdominal mass was the first abnormality noted in 40.5 per cent of the cases, and it was present at the time of examination in all but one case. Pain and hematuria as the presenting symptoms occurred in 28.9 and 17.4 per cent, respectively. The tumor is usually sharply demarcated from the renal substance, which it displaces and distorts, eventually pushing up under and distending the capsule of the kidney. The tumor may be roundish or nodular and on cut section may present a glistening appearance varying from white to brown. It may be lobulated, is usually solid and yet resilient, and not infrequently gives evidence of hemorrhagic, cystic or necrotic degeneration. Microscopically all Wilms' tumors contain areas of glandular tissue, ranging from ill defined to clear cut acini comparable to those seen in the average adenocarcinoma. Intimately associated with the acini are hyperchromatic, round, oval or spindle cells that resemble those of fibrosarcoma or myosarcoma. Wilms' tumors are highly malignant. The effect of irradiation is evidenced histologically and grossly by disintegration and necrosis, or by no change whatever; that is, the cells are either destroyed completely or are entirely unaffected. The proper treatment of these tumors should include both irradiation and, at an appropriate time, surgical removal. Although one patient has lived for thirteen and one-half years following nephrectomy, without receiving any irradiation, the remarkable immediate effect of roentgen therapy on highly malignant tumors of this type renders this form of treatment a valuable adjunct in combating these growths. The length of life from the onset of symptoms until death was very short for the group of patients who were in the advanced stages of the disease and who received only symptomatic treatment. The group of patients who were treated by irradiation and nephrectomy survived approximately twice as long as the group treated by operation or irradiation separately. Both radium and high voltage roentgen therapy have been used, and sometimes the two may be used for the same patient. A large rubber tube may be left at the time of operation for the purpose of inserting radium directly into the wound during the immediate postoperative period. The general principles involved in the surgical removal of Wilms' tumors are similar to those employed in the extirpation of any malignant renal tumor. The usual posterolumbar incision will generally give adequate exposure. Care should be taken to remove all the perirenal fatty tissue possible, as this may be involved by the neoplasm. One should feel for extension along the renal pedicle or retroperitoneal lymph nodes and remove any involved portions if possible. If a few involved lymph nodes remain that cannot be removed, it may be advantageous to place a large rubber tube in this region for the purpose of inserting radium directly into it. Of the forty-four patients who were traced up to the present time, forty are known to be dead. Of the twenty patients who underwent nephrectomy, fifteen are dead, four are living and one was not traced. Of the four patients who survived nephrectomy, only two have survived for any appreciable length of time (13.2 and 3.2 years, respectively). The other two patients were operated on too recently (six months ago) to permit any conclusion regarding the final result.

Acid Medication in Treatment of Bacilluria.—Crance and Maloney used nitrohydrochloric acid successfully in the treatment of five cases of bacilluria. They administered it four times a day in doses of 10 minims (0.6 cc.). They have used 4 drachms of nitrohydrochloric acid (not the dilute) and enough water to make 4 ounces (120 cc.). One drachm of this mixture in two thirds of a glass of water followed by a full glass of water was given the patient after meals and late at night. The treatment is presented for use in bacilluria of the Escherichia variety. Nitrohydrochloric acid reduces the p_H to 5 or below in apparently less time than the ketogenic diet and can be administered to the patient without hospitalization and without change in the ordinary diet. Urinalysis, regularly done, in all cases thus far treated has failed to show any damage to the kidney by the consistent absence of albumin and casts. One of the patients, in whom the ketogenic diet failed, recovered under the nitrohydrochloric acid treatment. The authors continue this medication for about one week after the culture has become sterile. They have treated three cases of the aerogenes variety, which, on acid therapy alone, have become symptom free and pus free but have not yielded sterile culture of the urine.

Kansas Medical Society Journal, Topeka

36: 221-264 (June) 1935

Some Medical Problems. J. F. Hassig, Kansas City.—p. 221.
Acrodynia. W. Brewer, Hays.—p. 225.
Primary Bronchogenic Carcinoma. L. E. Wood, L. B. Spake, W. W. Summerville and G. M. Tice, Kansas City.—p. 227.
Epilepsy. W. S. Lindsay, Topeka.—p. 234.

Maine Medical Journal, Portland

26: 83-108 (June) 1935

Pyelonephritis of Pregnancy from the Urologic Point of View. C. N. Peters, Portland.—p. 92.

Missouri State Medical Assn. Journal, St. Louis

32: 217-260 (June) 1935

Our Obligation to Organized Medicine: President's Address. C. T. Ryland, Lexington.—p. 217.
The Doctor of Tomorrow: Address of President-Elect. E. L. Miller, Kansas City.—p. 221.
Pathologic and Clinical Aspects of Early Skin Carcinoma. R. L. Sutton Jr., Kansas City.—p. 224.
Thrombo-Angiitis Obliterans (Buerger): Its Recognition and Treatment by the Practitioner. P. S. Lowenstein, St. Louis.—p. 227.
The Diagnosis of "Neurosis." S. J. Conrad, Kansas City.—p. 233.
Diabetic Coma Without Presence of Diacetic Acid or Acetone in Urine. F. Neuhoff, St. Louis.—p. 235.
Cardiac Hazards of Gallbladder Surgery. V. T. Williams, Kansas City.—p. 236.
Undulant Fever from Goat Milk Infection: Report of Case. D. B. Robinson, Kansas City.—p. 239.
Cooperative State Tuberculosis Control Program. S. P. Child, Mount Vernon.—p. 240.

Nebraska State Medical Journal, Lincoln

20: 201-240 (June) 1935

Purposes of Our Association. C. A. Selby, North Platte.—p. 201.
Allergy in General Medicine. T. D. Cunningham and J. C. Mendenhall, Denver.—p. 204.
Cancers of Face and Oral Cavity. A. F. Tyler, Omaha.—p. 209.
Method of Handling Ruptured Appendixes. C. H. Arnold and L. V. Gibson, Lincoln.—p. 211.
Oliver Wendell Holmes: Poet and Physician. T. E. Kane, Omaha.—p. 216.
Treatment of Pernicious Anemia, with Especial Reference to Parenteral Method. R. H. Young, Omaha.—p. 222.
Acute Middle Ear and Mastoid Infections. B. M. Kully, Omaha.—p. 225.
Congenital Anorchia: Report of Case of Unilateral Anorchia. L. M. Stearns, Kearney.—p. 227.

New Orleans Medical and Surgical Journal

87: 809-876 (June) 1935

Influence of the State on Medical Education. S. Bayne-Jones, New Haven, Conn.—p. 809.
Highway Accidents in Mississippi. E. C. Parker, Gulfport, Miss.—p. 816.
Modified Coutard Technic in Treatment of Malignancies of Throat. L. J. Menville and J. N. Ané, New Orleans.—p. 817.
Roentgen Therapy in Nonmalignant Conditions. J. C. Rodick, New Orleans.—p. 820.
Surgical Complications of Ringworm of Feet. J. A. Colclough, New Orleans.—p. 823.
Analysis of One Hundred and Eighty-Five Cases of Tetanus from the New Orleans Charity Hospital, with Special Note on Avertin. F. F. Boyce and Elizabeth M. McFetridge, New Orleans.—p. 825.
Subdeltoid Bursitis: Its Treatment by Physical Therapy. N. H. Polmer, New Orleans.—p. 829.

New York State Journal of Medicine, New York

35: 563-612 (June 1) 1935

Functions of the American Medical Association: Address Delivered at the 129th Annual Meeting of the Medical Society of the State of New York, Albany, May 14, 1935. W. L. Bierring, Des Moines, Iowa.—p. 563.
Prevention of Secondary Traumas in Treatment of Automobile Fractures. W. Darrach, New York.—p. 568.
Emotional Imbalance in Children: Calcium and Inorganic Phosphorus Blood Serum Determination. C. G. Kerley, E. J. Lorenze Jr. and Emma R. Godfrey, New York.—p. 571.
Tattooing of Nose and Face Following Automobile Injuries. W. W. Carter, New York.—p. 573.
Nonspecific Ulcerative Colitis, Terminal (Distal) Ileitis, and Bacillary Dysentery: Their Common Pathogenesis. J. Felsen, New York.—p. 576.
*Distribution and Diagnostic Significance of Lead in Human Body. C. N. Myers, Florence Gustafson and B. Throne, New York.—p. 579.
Irritating Properties of Cigaret Smoke as Influenced by Hygroscopic Agents. M. G. Mulinos and R. L. Osborne, New York.—p. 590.
The Ethics of Vivisection. S. W. Lambert, New York.—p. 592.

Diagnostic Significance of Lead in Body.—The investigation of Myers and his associates in 500 cases not known to be associated with lead exposure has pointed out various syndromes that may be associated with the "subchronic" type of lead poisoning. Common sources of poisoning, such as foods, drugs and environment, are discussed. One should be on the alert for the possible presence of lead in drinking water, fruits and vegetables. People suffering with obscure gastro-intestinal and cardiovascular disturbances should be examined with the greatest care. Early symptoms that are of importance are loss of appetite, nausea, weariness, constipation, headaches, eye symptoms and circulatory manifestations. For the present, the laboratory investigator and clinician should certainly give attention to all values of more than 50 micromilligrams of lead per liter of urine. About 20 micromilligrams per liter is probably somewhere near the expected limit. In the examination of blood, it is believed that 24 micromilligrams of lead per hundred cubic centimeters covers the patients of the "subchronic" type and that 6 micromilligrams is probably a value somewhat nearer that which should be expected. In the case of hair, it appears that lead finds its way with a great deal of difficulty into the hair, and, when lead is found, it may be of diagnostic significance, depending on the habits of the patient. Under the present mode of living, lead undoubtedly plays a part in many other diseases and should always be given consideration when the clinician is unable to place his finger immediately on some definite syndrome.

Ohio State Medical Journal, Columbus

31: 401-480 (June 1) 1935

Problems in Treatment of Fractures of Upper Extremity. W. Hoyt, Akron.—p. 417.
*Convulsions in Infancy: Statistical Study of Four Hundred Cases. J. E. Brown Jr., Columbus.—p. 423.
Thyroid Factor in Mental Disease. N. W. Kaiser, Toledo.—p. 431.
Prevention and Treatment of Diphtheria. H. H. Pansing, Dayton.—p. 436.
Practical Ophthalmoscopy. W. C. Davis, Columbus.—p. 439.
Complications of Otitis Media Involving the Petrous Pyramid. W. H. Evans, Youngstown.—p. 441.
Blood Pressure: Effective Method of Control. W. F. Brokaw, Cleveland.—p. 448.

Convulsions in Infancy.—Brown reviewed 2,279 consecutive records, over a period of thirty-eight and one-half months, in babies less than 2 years of age, finding 400 cases in which there were convulsions immediately prior to or during the hospital stay. Acute infection alone accounted for 30 per cent of the convulsions, with pneumonia, the acute disorders of the upper respiratory tract and sepsis being the principal offenders. The hemolytic streptococcus was responsible for the majority of the septic cases, being closely followed by the pneumococcus and Staphylococcus aureus. Acute intestinal disorder, or alimentary intoxication, accounted for only 2.7 per cent of the total, with convulsions usually an indication of impending death. Acute disease of the central nervous system contributed 15.5 per cent to the total, with meningitis responsible for most of the cases. The influenza bacillus, the pneumococcus and the tubercle bacillus were the principal etiologic agents. Most of the remaining cases were due to acute encephalitis, secondary to lead, to pertussis and of undetermined origin. Infantile tetany represented 11.3 per cent of the series. Tetany was found to be comparatively frequent in the first four months of life, and uncommon after 1 year of age. Rickets was commonly found in the spasmophilic infant, the incidence increasing with the age of the patient. Similarly, as the infant with latent tetany grew older, acute infection was increasingly apt to be the activating agent. The highest incidence of tetany occurred at a double peak, in winter and early spring. Cerebral birth injury is responsible for only 8.5 per cent of the entire series, although in the neonatal period it is the chief offender. Intracranial hemorrhage is most often the result of birth injury but may be due to hemorrhagic disease of the new-born or fetal erythroblastosis. Cerebral deficiency was found in 9.5 per cent of the convulsive cases and was ordinarily the sequel of birth injury. The tentative diagnosis of epilepsy was made in only 1.5 per cent of the series, because of the lack of chronicity in many cases, which may later prove truly epileptic, and the fact that encephalograms revealed cerebral deficiency in a large number that might otherwise have been called idiopathic epilepsy. Lead poisoning, often with encephalitis, accounted for 2.3 per cent. Among the less frequent causes of convulsions are congenital abnormality of the heart, sinus thrombosis, subdural hematoma, congenital syphilis and other miscellaneous conditions, in several of which the convulsions were terminal accompanying a secondary infection. Sodium bicarbonate may be a dangerous drug, as two cases of alkalosis with convulsions occurred in infants to whom it had been administered therapeutically. No cases were observed in which enlarged thymus, teething, constipation, worms or phimosis could be held solely accountable.

Philippine Islands Med. Association Journal, Manila

15: 239-304 (May) 1935

Gastric Analysis by Fractional Method Among Normal Filipinos. A. Liboro and S. Ortiga Jr., Manila.—p. 239.
Dermatitis Exfoliativa of the New-Born. J. Albert and J. L. Paguyo, Manila.—p. 249.
Early Leprosy in Infants Born of Leprous Parents: Report of Cases. C. B. Lara and B. de Vera, Culion.—p. 252.
Ureteral Calculus: When to Operate. J. Eduque and A. T. Zavalla, Manila.—p. 269.
Treatment of Tricophytosis of the Feet by Formalin and Wright Stain. E. Y. Garcia, Manila.—p. 273.
Height and Weight of Aged Filipinos. G. T. Lantin, Manila.—p. 277.

South Carolina Medical Assn. Journal, Greenville

31: 95-110 (May) 1935

Cardiovascular Renal Disease in the Negro. J. C. Norris, Atlanta, Ga.—p. 95.
Brucellosis. O. B. Mayer, Columbia.—p. 99.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Indian Medical Gazette, Calcutta

70: 241-300 (May) 1935

*Treatment of Psoriasis. D. Panja and P. A. Maplestone.—p. 241.
Splenectomy for Tropical Splenomegaly. A. N. Palit.—p. 243.
Epidemic Measles in Assam. D. Manson.—p. 248.
Epidemic of Cerebrospinal Fever in a Closed Commuity: Note. R. B. Lal and M. Yacob.—p. 252.
Clinical Observations on Cerebrospinal Meningitis in Indore. J. R. J. Tyrrell and H. S. Kapur.—p. 257.
Nephrosis: Its Nature and Incidence in Indians. S. P. Gupta.—p. 258.
Clinical Evidence of Rheumatic Fever in the Punjab. K. L. Wig.—p. 260.
*Simple Technic for Detection of Small Traces of Chloroform in Vaccine Lymph. K. S. Shah.—p. 263.

Treatment of Psoriasis.—Owing to the burning pain at the site of injection and the number of injections required in the treatment of psoriasis with alcoholic and formaldehyde suspensions of scales of psoriasis, Panja and Maplestone decided to cut out a piece of tissue from psoriasis lesions and make an emulsion of it for injection. Their idea was that the parasite, if it is a filtrable virus, will be found not only in the scales but also deeper down in the dermis. This probability, they state, is supported by the fact that the epidermal changes have been shown to follow changes in the dermis, such as dilatation of the vessels and elongation of the papillas. These pathologic manifestations suggested that the filtrable virus might be present in the corium in a more virulent state than in the more or less dry epidermal scales. They select an acute or a subacute early patch and dab it with rectified alcohol; then a small piece of the diseased skin to the depth of the corium is snipped off. The piece is weighed and mixed with pumice-stone dust and crushed in a sterile mortar until a uniform paste is produced. A few drops of physiologic solution of sodium chloride may be necessary to make a good paste. The paste is mixed with a measured quantity of physiologic solution of sodium chloride to make up the suspension to the strength of 10 mg. in 1 cc. It is filtered through an infusorial earth filter and the filtrate thus obtained is filtered again through sterilized Pasteur-Chamberland L3 candles, and 0.05 per cent phenol is added to the final filtrate. The initial dose was 0.1 cc. and it was injected intradermally. The injections were repeated every third or fourth day, the dose being increased each time by 0.1 or 0.2 cc., up to 1 cc. When the dose reaches 0.5 cc., subcutaneous injection is better, as by this means the pain of intradermal infiltration is avoided. A course of from ten to twelve injections was given as a rule and, if necessary, this was repeated after a fortnight; but only in a few cases was a second course necessary. There was no reaction or pain following injections. Twenty-eight cases were treated by the method. Four were quite cured; eight were nearly cured, only a few minute spots being left; two cases were apparently cured, but relapses took place after three months and they are now improving on another course of injections; three cases did not respond to treatment, and one flared up after two injections. The authors obtained equally good results with an autogenous filtrate or one from some other patient.

Detection of Chloroform in Vaccine Lymph.—Shah describes a method for detecting chloroform in vaccine lymph. About 5 cc. of absolute alcohol is put in a glass test tube. A current of air (supposed to contain traces of chloroform) is passed through it for a few minutes. About 2 cc. of a solution of beta-naphthol in a strong solution of potassium hydroxide is added. This is heated to 50 C. in a water bath. If chloroform is present a blue or greenish blue color will develop. The author believes that the method will be of considerable help in determining the time lymph should be subjected to aeration after chloroform has been used.

Irish Journal of Medical Science, Dublin

No. **113:** 193-240 (May) 1935

Discussion on Relations of the Teaching Hospitals to the Medical Schools, the Medical Profession and the Public. H. Moore.—p. 193.
The Milk Bill, 1934. W. P. O'Callaghan.—p. 217.
Ten Years' Work at the Children's Sunshine Home, Stillorgan. Ella Webb.—p. 225.

Lancet, London

1: 1199-1256 (May 25) 1935

Biochemical Basis of Thyroid Function. C. R. Harington.—p. 1199.
*Staphylococcic Pneumonia Among Infants in a Maternity Hospital. C. M. Smith.—p. 1204.
Recent Observations on Psittacosis. W. Levinthal.—p. 1207.
Cardiac Mensuration. F. G. Wood.—p. 1210.

Staphylococcic Pneumonia Among Infants.—Smith reports the instances of four infants born in July in a maternity hospital who died of pneumonia within four days of one another. Three of the children became ill within twenty-four hours after leaving the institution, although no abnormality was observed at the time of dismissal, and the other one died in the hospital. The duration of illness in each case was about two days. At necropsy, which was held in two cases, the cause of death was shown to be staphylococcic pneumonia, and a pathologic feature was that in both instances consolidation was on macroscopic examination confined to a single lobe, thus simulating acute lobar pneumonia. From swabs taken from infants in the hospital, six of whom were suffering from catarrhal symptoms, profuse growths of Staphylococcus aureus were recovered from the nasal and faucial passages in practically all cases. Examination of a control group of infants in another institution demonstrated the unusual incidence of the staphylococcic infection among the children in the infected hospital. It was ascertained that within the previous fortnight an infant had died of a phlegmonous abscess, that three mothers and an infant had suffered from suppurative mastitis, and that among the infants there had been an unusual prevalence of minor septic skin lesions followed by a number of cases of mild catarrh of the upper respiratory tract. Further, six cases of mastitis after dismissal were discovered among fifty-five mothers who left the hospital during July and the first week of August. With the possible exception of the phlegmonous abscess, the author considers all the foregoing cases, including the four fatal pneumonia cases, to have been different manifestations of staphylococcic infection and to form one epidemiologic group. The spread of the disease was possibly facilitated by the nature of the temporary sleeping arrangements provided for the infants.

Practitioner, London

134: 577-704 (May) 1935

Advance of Medicine During the Last Quarter of a Century. H. Rolleston.—p. 577.
The Problem of Allergy. R. J. S. McDowall.—p. 581.
Treatment of Asthma. J. L. Livingstone.—p. 591.
Hay Fever and Its Treatment. C. Francis.—p. 601.
Some Unusual Examples of Allergic Reaction. G. W. Bray.—p. 610.
Bacterial Allergy and Its Relation to Tuberculosis and Rheumatic Fever. W. R. F. Collis.—p. 617.
Allergy in Relation to Diseases of the Skin. G. B. Dowling.—p. 627.
Vitamins in Health and Disease. A. Abrahams.—p. 637.
Influenza: A Comparison. H. S. Gaskell.—p. 646.
Total Thyroidectomy in Treatment of Heart Disease and Angina Pectoris. G. Bankoff.—p. 656.
The Problem of the Mental Patient: Methods of Admission into County Mental Hospitals. E. D. T. Roberts and S. A. Mackeith.—p. 665.
Treatment of Internal Hemorrhoids. J. W. Riddoch.—p. 673.
Nonoperative Treatment of Urinary Stone. S. Power.—p. 678.
Thrombophlebitis in Cancer. T. G. I. James and N. M. Matheson.—p. 683.
Favorite Prescriptions: V. The Pharmacopeia of the Middlesex Hospital. E. A. Cockayne.—p. 685.

South African Medical Journal, Cape Town

9: 253-292 (April 27) 1935

Pneumonia: . I. Clinical Aspects of Pneumonia on the Rand. J. M. Verster.—p. 255.
Id.: II. Pneumonia as It Occurs on Witwatersrand in Non-Europeans. F. Daubenton.—p. 257.
Id.: III. General Treatment. W. H. Palmer.—p. 259.
Id.: IV. Serum Treatment. H. L. Heimann.—p. 261.
Mental Disorder and the Law. H. E. Brown.—p. 264.
Narrow Mindedness in Medicine. J. B. V. Watts.—p. 269.
Random Recollections. A. F. G. Guinness.—p. 272.
Specialist. M. G. Pearson.—p. 276.

9: 293-328 (May 11) 1935

Pituitary Tumor: Gigantism. E. A. Seale.—p. 295.
First South African Institution for Epileptics. M. J. Cohen.—p. 299.
Intra-Ocular Foreign Body Removed by Means of Two Incisions of Cornea. T. Wassenaar.—p. 301.
Peptic Ulcer. A. L. McGregor.—p. 302.
Vertex Presentation with Extended Head. L. J. te Groen.—p. 305.
Organization of Fight Against Cancer. M. J. A. des Ligneris.—p. 306.
Introduction to Psychic Diagnosis. P. J. Van Coller.—p. 313.

Annales de l'Institut Pasteur, Paris

54: 649-776 (June) 1935

Primary Tuberculous Infection of Conjunctiva in Man. V. Morax and E. Rist.—p. 653.
*Studies on Tuberculous Ultravirus. G. Sanarelli and A. Alessandrini. —p. 676.
Antituberculous Immunization of Newly Born Guinea-Pig and Rabbit by Means of B C G Absorbed Orally. L. Nègre.—p. 697.
Serologic Analysis of Different Lipoid Fractions of B C G. E. Chargaff and W. Schaefer.—p. 708.
Microbic Variation Observed in Strain of Bacterium Dysenteriae. A. Compton.—p. 715.
Biochemical Studies on Bacterium Tumefaciens Smith and Townsend. G. Amoureux.—p. 730.
Antirabic Vaccinations. J. Viala.—p. 764.

Tuberculous Ultravirus.—Sanarelli and Alessandrini report a series of experiments on the tuberculous virus, using double collodion sacs for both in vivo and in vitro investigations. They attempted to determine the extremes and limits of use of the collodion sacs for this type of experiment. It was confirmed that the "tuberculous protogenes" developed in the external cells of the double collodion sacs either in the peritoneal cavities of rabbits or in tubes containing Sauton's liquid and could become implanted and develop equally well in the new Löwenstein medium. The tuberculous protogenes, usually weakly or nonpathogenic for guinea-pigs, could develop in the latter medium into typical tuberculigenic macrocultures or into invisible, nonpathogenic microcultures. The last mentioned are capable, by subculture, of producing macrocultures possessing tuberculigenic properties. The use of egg nutrient mediums is necessary to obtain cultures of "tuberculous protogenes." Long cultivation in vivo or in vitro progressively weakens the vitality and powers of adaptation and multiplication of the tuberculous protogenes. Among the factors able to impede the development of the protogenes is the weakly bactericidal action exerted by the peritoneal fluid. The progressive diminution of vegetative power of the protogenes occurring in the double collodion sacs lying in Sauton liquid suggests that it is the long absence of air that causes their arrested development. This absence of air has also an unfavorable effect on adult tubercle bacilli. The authors conclude that the technic of double collodion sacs lends itself well to the study of filtrable elements of the tuberculous virus.

Archives de Maladies de l'Appareil Digestif, Paris

25: 441-552 (May) 1935

Cancerized Ulcer or Ulcer-like Cancer. B. Desplas and G. Durand.—p. 441.
Rectosigmoid Pseudocancer of Amebic Origin. Guichard and Paponnet. —p. 450.
*Histidine in Gastric Therapeutics. L. Manginelli.—p. 460.

Histidine in Gastric Therapeutics.—On the basis of the conception gained largely from animal observations that gastric ulcer is a result of general metabolic disorder due to amino acid (histidine) deficiency, Manginelli treated fifty-one patients with histidine. He used 2 cc. of a 4 per cent solution at a dose. The solution was weakly acid. The injections were usually made intramuscularly, although the intravenous route was also found satisfactory. They were made daily for twenty or thirty consecutive days and, after a brief period of rest, a second series of from fifteen to twenty injections was given. Rarely was a third series employed. When the injections were given intramuscularly the author preferred the hour just before a meal; when intravenously, just after eating. In gastroduodenal ulcers the rapid and intense analgesic effect of histidine was striking. The accessory symptoms also improved: tolerance for food, localized areas of tenderness to pressure and the roentgenologic picture. In gastritis the results were less prompt and constant. Histidine is indicated for the gastric neuroses because of its analgesic effect and of the reestablishment of the vegetative system equilibrium. He concludes that histidine exerts an intense analgesic action on several painful syndromes. In ulcers and some forms of gastritis it has in addition a specific curative action on the final phase of the anatomic process, serving also as a specific reconstructive material. The mechanism of action is probably both plastic and chemical, which accounts for its elective therapeutic effect.

Minerva Medica, Turin

1: 769-800 (June 2) 1935

Primary Endocarditis Due to Streptococcus Viridans. F. Micheli.—p. 769.
*Serum Proteins in Pathologic Pregnancy and Puerperium. R. Olivetti and G. Valle.—p. 777.
Metabolism of Carbohydrates in Prehypophyseal Disturbances: Diagnostic Value of Glycemia. G. C. Dogliotti.—p. 783.
*Positive Casoni Reaction in Suppurative Echinococcosis: Two Cases. M. Cortesini.—p. 785.

Serum Proteins in Pathologic Pregnancy and Puerperium.—Olivetti and Valle state that the content of whole proteins in the blood in normal pregnancy and the puerperium is lower than that in normal conditions, although there is a shift to the left of the albumin-globulin quotient, which is more marked during the puerperium. The variations of proteinemia in either normal or pathologic pregnancy are not related to a dysfunction of the liver, but the hypotheses that hyperglobulemia is a reaction of defense of the pregnant organism against ovular toxins or a modification of the plasma due to endocrine hyperfunction are not as yet proved. The predominance in the quantity of globulins over that of serum albumins during the first days of the puerperium seems to be due to the greater velocity in regeneration of the former over that of the latter, following considerable or repeated losses of plasma due to the hemorrhage of labor, the elimination of lochia and lactation. Serum proteins follow the same behavior in normal pregnancy and in the various diseases that occasionally complicate it. But the fact that they act differently in the diseases that specifically complicate pregnancy makes the conception of Seitz and Eufinger, that certain toxicoses of pregnancy are due to a dysfunction of the blood colloids and ions, unacceptable. The occasional deviations of the protein formula in the various toxicoses of pregnancy are neither constant nor univocal and are not proportional to the seriousness of the pathologic condition. The determination by the authors of the osmotic pressure by Govaert's formula, in cases of pregnancy edema, showed that there is a relation between the lowering of the osmotic pressure and the retention of the fluids in the tissues. The results indicate that qualitative and quantitative variations of serum proteins are an important factor in the pathogenesis of edema. In puerperal infection there is a lowering of the protein quotient similar to that which is observed in some other infectious diseases. If globulins have mechanical properties for the transportation of immune bodies, as has been hypothetically assumed, the deviation of the protein quotient in puerperal infection should be considered a reaction against the infection.

Casoni's Reaction in Suppurative Echinococcosis.—Cortesini calls attention to the importance of a positive Casoni reaction in the diagnosis of suppurative echinococcosis of the liver and of the lung, after removal of an echinococcus cyst from either organ. He reports two cases in which the reaction continued positive after removal of a large nonsuppurative echinococcus cyst of the liver in the first case and of a suppurative echinococcus cyst of the lung in the second. The reaction became negative after a second elimination of the cysts, both suppurative and nonsuppurative, in the two cases. The author explains that the persistence of the positive reaction was caused by antigens in the circulation, originating in the remaining cyst and maintaining the allergy of the patient. The suppuration probably caused leukocytosis and the disappearance of eosinophils in the two instances without interfering with the biologic mechanism of the allergy.

Pediatria, Naples

43: 617-743 (June 1) 1935. Partial Index

Actual Reaction of Feces of Children: Colorimetric Determination. R. Pachioli and V. Mengoli.—p. 617.
Allergy to Cow's Milk and to Egg White in Children with Cutaneous Manifestations of Exudative Diathesis. E. Zambrano and E. Pezza. —p. 642.
Hematologic Composition of Marrow in Early Childhood: Studies "in Vivo." F. Tecilazic.—p. 658.
Blood Enemas in Treatment of Dystrophy of Infants. N. Carrara.—p. 686.
Asymptomatic Evolution of Pulmonary Abscess in Course of Sepsis in Infant: Case. F. Pontieri.—p. 708.

Klinische Wochenschrift, Berlin

14: 809-840 (June 8) 1935. Partial Index

*Prognosis and Treatment of Children with Tetanus. C. Noeggerath. —p. 814.
Fluorescence of Dry Picture of Human Cerebrospinal Fluid. C. J. Keller and H. Schoen.—p. 817.
*Clinical Experiences with Carbohydrate and Low Fat Diet in Patients with Diabetes Mellitus. M. Krakauer.—p. 820.
Standardization of Estrus-Producing Hormone and Its Derivatives. W. Schoeller, M. Dohrn and W. Hohlweg.—p. 826.
Comparison of Action of Cardiazol and Coramine on Respiratory Center of Human Subjects. H. Steininger and E. Gaubatz.—p. 827.

14: 841-880 (June 15) 1935. Partial Index

Present Status of Chemistry and Biochemistry of Vitamins. H. Willstaedt.—p. 841.
Adrenal Cortex Extract and Vitamin C in Treatment of Circulatory Weakness Developing in Diphtheria. P. Bamberger and L. Wendt. —p. 846.
Angina Pectoris in Severe Anemia. O. Zimmermann.—p. 847.
*Prognosis and Treatment of Children with Tetanus. C. Noeggerath.—p. 852.
Cells in Cerebrospinal Fluid in Tuberculous Meningitis. H.-E. Wedemeyer.—p. 858.

Treatment of Children with Tetanus.—Noeggerath, in discussing the prognosis of children with tetanus, points out that formerly it was based, just as in adults, on the length of the period of incubation. The shorter incubation periods (up to ten days) were considered as a much more unfavorable sign than the longer incubation periods. In the new-born the limit was set at six days. The author analyzes his own material of fourteen cases and finds that their outcome largely corroborates the former opinion in regard to the unfavorable prognosis of cases in which the incubation period is short. However, he gained the impression that the rapidity of the progress of the disease is likewise an indicator of the outcome. In this connection he calls attention to the five phases that have been differentiated in the course of tetanus. It appears that, if the symptoms of the advanced stage appear soon, the prognosis is unfavorable, whereas, if they do not, the prognosis is relatively favorable. In discussing the prospects of the treatment of tetanus in children, the author points out that he saw no noticeable difference in the efficacy of the earlier or later onset of the treatment. The author gives his attention to the causes of death and stresses that the failure of the circulatory and respiratory systems is of great importance. He points out that spasms of the involuntary muscles, particularly of those of the respiratory organs, play an important part in tetanus of children. In the treatment of tetanus, attention must be given chiefly to the respiration. The spasms of the respiratory organs must be counteracted by spasmolytic remedies, but the administration of oxygen is likewise important. An oxygen tank should always be in readiness, particularly during the stage of the reflex spasms. It is also important to quiet the patient and to counteract the spasms. In this connection the author evaluates the use of sedatives and hypnotics. The specific treatment of tetanus has two chief aims: to render the focus of infection harmless and to neutralize the toxin of tetanus. Not much can be gained by the surgical treatment or cleansing of the infected wound after tetanus has already developed. Opinions are still divided on the second aim of the specific treatment, the neutralization of the tetanus toxin. The author thinks that large doses of the tetanus antitoxin are required.

High Carbohydrate and Low Fat Diet in Diabetes.—Krakauer reports his observations on adult patients with diabetes mellitus who were free from coma and from other complications. He commences the treatment by completely stopping the old diet and putting the patient on a milk diet for from one to three days. After the milk days he gives a mixed diet, if possible, without insulin. Carbohydrates are added to the diet in proportion to the increasing tolerance. The fat intake is restricted so as to avoid acidosis. Protein is given in quantities of 1 Gm. or slightly more for each kilogram of body weight. The diet is varied and takes into account the desires and requirements of the patients. The calories are reduced to a minimum. This type of dietetic treatment produced better results than the diet providing large quantities of fat formerly employed by the author. The new diet proved especially helpful in patients with persistent hyperglycemia and acetonuria. In general, this diet produced a higher carbohydrate tolerance and made possible the intake of a larger number of calories when it was completed. In 83 per cent of the patients, sugar as well as ketone disappeared from the urine. The blood sugar became normal in 25 per cent. In 23 per cent, insulin treatment had to be continued. The patients liked the diet, for it satisfies; adjustment to it is effected quickly and it can soon be complemented, so that it can serve as a satisfactory permanent diet.

Medizinische Klinik, Berlin

31: 769-800 (June 14) 1935. Partial Index

Tuberculous Polyarthritis. W. Berger and Paul Ludewig.—p. 772.
*Local Hyperplasia of Fat Tissue Following Insulin Injections. D. Adlersberg.—p. 779.
Roentgen Therapy in Bone Metastases of Carcinoma. J. Borak.—p. 782.
Etiology of Acute Necrosis of Pancreas. Maria Mittelbach.—p. 785.

Local Hyperplasia of Fat Tissue Following Insulin Injections.—Adlersberg observed in a woman, aged 20, who had had diabetes since her 14th year, soft, cushion-like, symmetrical swellings, about the size of a fist, on the lateral portion in the lower third of the upper arms and on the thighs. The skin over these swellings can be moved readily and there is no sensitivity to pressure. Palpation reveals that the fat tissues at these sites are from two to three times the normal thickness. These lipomatous formations are at the sites used by the patient for the insulin injections. In the course of three years the patient was repeatedly advised to avoid injections into the one or the other of these lipomatous formations. When injections into a certain swelling were avoided for two or three months there was only a slight reduction in their size, never a complete disappearance. At first it was considered possible that the procaine hydrochloride which the patient added to the insulin might be a cause of the fat hypertrophy. This was considered the more likely since procaine hydrochloride exerts a favorable influence on the atrophy of the fat tissue that has been observed in some diabetic patients at the site of the insulin injection. That this assumption was erroneous was proved by the fact that for several years the patient had added procaine hydrochloride only to the insulin that she injected into the arms but not to that which she injected into the thighs, justifying this by asserting that the skin of her arms is more sensitive than that of the thighs; yet the swellings on arms and thighs were of about the same size. The assumption that traumatic influences might be responsible could not be corroborated, and the author concludes that the lipomatous swellings are due to the insulin injections as such. A careful search for similar cases among the large diabetic material of the author's clinic disclosed one other case concerning a man, aged 21. The author thinks that this disorder affects chiefly young persons, and he assumes that, like the insulinogenic atrophy of the fat tissue, this hypertrophy is largely the result of a predisposition. He thinks that the disorder might be prevented by using for the injection as many different sites as possible.

Strahlentherapie, Berlin

53: 1-192 (May 29) 1935. Partial Index

Technic and Dosage of Roentgen Irradiation in Intracranial Disorders. M. Sgalitzer.—p. 3.
Coutard's Method of Roentgen Treatment of Malignant Tumors. J. Nielsen.—p. 25.
Transcutaneous Radium Therapy of Cancer of Tonsils. L. Mallet.—p. 54.
*Indications for Roentgen Therapy in Metrorrhagias During Menopause. M. C. Béclère.—p. 62.
Roentgen Irradiation of Hypophysis in Treatment of Hyperthyreosis. J. Borak.—p. 73.
Does Thymus Influence Number of Granulocytes? S. Radojević and A. Hahn.—p. 90.

Roentgen Therapy in Metrorrhagias During Menopause.—Béclère discusses the indications for roentgen therapy in the metrorrhagias that develop during the menopausal age. He emphasizes the importance of an etiologic diagnosis, in order to discover the patients who have objective pathologic changes in the uterus or in the oviducts. He thinks that such changes can be found in about 30 per cent of the patients. Especial efforts must be made to detect the cases of cancer of the uterus, which amount to about 8 per cent of the total. The objective pathologic changes can usually be determined

by means of hysterosalpingography following the intra-uterine injection of iodized poppy-seed oil. Moreover, hysterography is helpful in guiding the biopsy. Biopsy and histologic examination are necessary in order to arrive at a definite diagnosis of cancer of the uterus. In about 70 per cent of the women who have metrorrhagia during the menopausal period, hysterography or histologic examination shows that the hemorrhages are of purely functional, usually ovarian, origin. In such cases roentgen therapy is helpful. The author recommends one irradiation each week and suggests that the doses be applied in such a manner that the total dose necessary for castration is given in eight sessions; that is, the treatment is distributed over a period of two months.

Zeitschrift f. d. ges. experimentelle Medizin, Berlin

96: 257-374 (May 24) 1935. Partial Index

Technic and Interpretation of Electrocardiogram. W. Schmitz and H. Schaefer.—p. 257.
Quantitative Determination of Elimination of Lead in Urine of Healthy Persons and of Persons with Lead Poisoning by Means of Diphenylthiocarbazon. B. Behrens and H. Taeger.—p. 282.
To What Extent Is Nitrogen Balance a Criterion for Sufficient or Insufficient Protein Intake? G. Machnitzky.—p. 304.
Experimental Studies on Action of Quinine on Extrasystoles and Extrasystolic Tachycardias. D. Scherf and H. Siedek.—p. 311.
Biologic and Chemical Properties of Antigonadotropic Hormone of Pineal Body. P. Engel.—p. 328.
*New Technic of Fuchs' Reaction for Diagnosis of Cancer. H. Minibeck. —p. 362.

New Technic of Fuchs' Cancer Reaction.—Minibeck points out that Fuchs' cancer reaction is too difficult to be performed in the average laboratory. He therefore devised a new technic which is based on a titration of the amino groups and which indicates differences of 0.23 mg. per hundred cubic centimeters. He determines the amino nitrogen value of the serum (1) without any addition, (2) following the addition of normal fibrin and (3) after the addition of carcinoma fibrin. He compared his technic with other methods of determination of the amino acids and found that his titration is well suited for a carcinoma reaction because it also determines the peptides and other cleavage products and because it is simple. In seventeen patients with carcinoma the outcome of his titration method tallied with the clinical diagnosis, as was the case also in twenty-three patients without carcinoma. In six cases the outcome of the test was doubtful. The determination of the amino acids according to Folin and Wu makes it possible, particularly in the cerebrospinal fluid, and, if larger quantities of cleavage products are present, to prove the presence of new amino groups in a parallel test to the titration. Without hydrolytic cleavage this colorimetrically determinable increase is only slight. A hydrolysis, as it is required for the determination of the peptides by the colorimetric method, is unnecessary in titration. The cleavage products cause from 10 to 60 per cent increase in the titrable amino nitrogen. These great fluctuations facilitate the estimation of the reaction.

Zeitschrift für Tuberkulose, Leipzig

73: 81-160 (June) 1935

*Stage Preceding and Course of Early Pulmonary Infiltrate. T. Rehberg. —p. 85.
*Significance of Nondetached Pleural Strands in Failure of Originally Successful Pneumothorax Treatment. O. Jüttemann.—p. 94.
Congenital Pulmonary Cyst Simulating a Disintegrating Infiltrate. H. Braeuning.—p. 106.
Occupation of Patients in Public Sanatoriums. T. Peters.—p. 109.
Pneumothorax Empyemas with Mixed Infection by Bacillus Lactis-Aerogenes. J. Alföldy.—p. 117.

Stage Preceding and Course of Early Pulmonary Infiltrate.—Rehberg points out that the opinions about the mode of development of the early infiltrate are still divided. He stresses that, in view of the deficiency of symptoms, roentgenologic examination is highly important during this period. He describes a case of early infiltrate in which the patient was under roentgenologic control from the time when the lung was still without a focus until five weeks later, when the infiltrate had already undergone cavernous disintegration. Then he describes another case in which the early infiltrate, the cavern as well as the dissemination, disappeared rapidly.

Nondetached Pleural Strands in Pneumothorax Treatment.—Jüttemann illustrates the danger presented by pleural strands first on the basis of an extreme case of so-called hanging cavern. Then he describes a number of cases in which the success of the pneumothorax therapy persisted for some time but in the end proved nevertheless to be only an apparent success. He shows that the failure of the pneumothorax treatment in these and similar cases is due to the persistence of pleural strands. He discusses how pleural strands may become harmful during the different phases of pneumothorax therapy and how they may prevent a permanent success of the treatment in spite of a good result in the beginning.

Zentrallblatt für Gynäkologie, Leipzig

59: 1393-1440 (June 15) 1935

Metastasization of Cancer of Internal Genitalia. H. Hückel.—p. 1394.
*Indophenol Blue-Oxygen Reaction of Blood in Cancer of Uterus. W. Michaelis.—p. 1409.
Therapy of Cancer of Corpus Uteri: Surgery or Irradiation? K. Nordmeyer.—p. 1415.
Contribution to Casuistics of Melanosarcoma of Vulva. L. Gerhardt. —p. 1421.
New Cock Hand Dropper with Scale for Administration of Anesthetic. O. Mäder.—p. 1424.
Tubal Sterilization. E. Engel.—p. 1428.

Indophenol Blue-Oxygen Reaction of Blood in Cancer of Uterus.—Michaelis determined the molecular oxygen in the venous blood of cancer patients. The venous blood is withdrawn and prepared under the exclusion of oxygen. In a mixture of dimethylparaphenylenediamine base and alpha naphthol with the addition of a 5 per cent solution of ammonia the envelops of the erythrocytes are destroyed and the molecular oxygen is liberated. During this process indophenol blue develops. After a certain time the quantity of indophenol blue is determined in the colorimeter that employs the monochromatic sodium light and is equipped with a millimeter scale. This determination is likewise made under the exclusion of oxygen. The author concedes that the quantity of molecular oxygen (that is, the indophenol blue value) has a definite relation to the hemoglobin content, for a person who has a hemoglobin value of only 50 per cent has, of course, a lower indophenol blue value than a person who has a hemoglobin content of 80 per cent. For this reason it is necessary to determine the hemoglobin content of the blood and to compare it with the indophenol blue value. The author found that, whereas in normal women a hemoglobin value of 70 per cent corresponds to an indophenol blue value of from 40 to 44.5 mm. on the colorimeter scale, in women with cancer a hemoglobin value of 70 per cent corresponds to indophenol blue values of from 48 to 55 mm. The higher indophenol blue value indicates thus the presence of cancer. The author shows tabular reports that bear this out. The correctly recognized positive cases (verified by histologic examination) amounted to 83 per cent. Tests on persons who were free from cancer gave positive results in 10 per cent, but in all other persons who were free from cancer the reaction was negative. In attempts to improve the indophenol blue-oxygen reaction, attention was given to the frequently increased sugar content of the blood of cancer patients and to the substances resembling fatty acid contained in it. The modified indophenol blue method overcomes these disturbing factors by preceding the blood withdrawal from the fasting patient by an administration of 20 units of insulin (two hours before) and by washing the blood with ether.

Hospitalstidende, Copenhagen

78: 505-532 (May 7) 1935

Facial Pain. V. Christiansen.—p. 507.
*Atrioventricular Block: Peculiar Case. W. T. Andersen.—p. 524.
Pellagra: Three Cases. A. Nyfeldt.—p. 529.

Atrioventricular Block.—In a boy, aged 15, the electrocardiogram showed complete block. After rest in bed for five months the condition was apparently unchanged. There is no history of any infection. The entire course, Andersen says, testifies against rheumatic block. Coronary sclerosis is excluded. The condition is attributed to a congenital malformation not manifested until now; the anomaly has caused an aortic and a mitral insufficiency and interrupted the connection between atria and ventricles. Because of the disorder of the valves the prognosis is grave.